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THE SELF-DIRECTED LEARNING READINESS OF BACCALAUREATE NURSING STUDENTS AND FACULTY AFTER ONE YEAR IN A PROBLEM BASED UNDERGRADUATE NURSING PROGRAM

by

Beverly Williams

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "The self directed learning readiness of baccalaureate nursing students and faculty after one year in a problem based undergraduate nursing program" submitted by Beverly Williams in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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Abstract

Baccalaureate nursing graduates must enter their professional careers with the understanding and ability to engage in continuing learning in order to ensure competence in professional practice. The graduate's ability to be self directed in learning is an important indication of the ability to pursue continuing learning as a professional practitioner. It has been surmised that Problem Based Learning (PBL) nursing programs facilitate the development of abilities to become self directed in learning. The purpose of this quasi-experimental study was to describe the self directed learning readiness of baccalaureate students and their faculty at the beginning and end of one year in a PBL undergraduate nursing program and to identify factors which might influence this readiness.

A three part questionnaire (biological characteristics, Self Directed Learning Readiness (SDLRS), and Self Directed Learning (SDL) opportunities and follow through on those opportunities) was completed by 135 first year nursing students and their eight faculty tutors at the beginning and at the end of the first year of the PBL program. Year end focus group interviews were held with both students and faculty to explore their experiences with learner control and responsibility.

While students consistently demonstrated average (SDLRS=220) scores, their faculty demonstrated above average (SDLRS=245) scores and this difference was significant. Although both students and faculty displayed a slight increase in SDLRS from the beginning to the end of the first year in the PBL program, the increase was not significant for either group. Students indicated that within the PBL structure they

had the opportunity to control variables involved in their learning between 50-75% of the time and faculty estimates of the frequency with which they provided students with SDL opportunities were similar to student estimates of having received those opportunities. Overall opportunity to control the majority of variables involved in their learning was a significant predictor of students' SDLRS scores. Students estimated that they followed through on SDL opportunities at least 50% of the time and faculty estimates of the frequency with which students followed through on these SDL opportunities were similar to student perceptions. During focus group interviews students were asked about their experiences in controlling variables (what to learn, how to learn and how to determine if learning has occurred) associated with learning within the structure of PBL. The following themes emerged from the data: (1) control as mirage (2) overwhelmed and uncertain (3) tutor as guide (4) confident and responsible and (5) PBL works and makes sense. Similar themes emerged from the faculty focus group interview data. Students at the end of one year in this PBL program were able to describe themselves as developing many of the characteristics commonly associated with self directed learners. The centrality of the tutor role in facilitating SDLR for students in a PBL program was confirmed. A conceptual model for facilitating SDL through PBL is provided.

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CHAPTER 1

Introduction

Professional education programs share the goal of preparing competent graduates who will successfully make the transition to the world of professional practice. Furthermore, society demands continued professional accountability for competence in an era of exponential knowledge proliferation and technological change (Cavanaugh, 1993; Houle, 1980; Norcini & Shea, 1993; Rhoades, 1991). One essential way to meet this demand is for every practicing professional to engage in continuing professional education (Clark, 1980; Houle, 1980; Oddi; 1988). To achieve the greatest potential, continuing professional education is best planned and managed by the individual professional (Houle, 1980). When a professional recognizes that learning is necessary or desired, the individual will need to determine what is to be learned, how best to learn it, and how well it is to be learned. This essentially means that continuing professional learning needs to be self directed (Cavanaugh, 1993; Bennett & Fox, 1993; Houle, 1980). If students of professional education programs are to graduate with the abilities to be self directed in their learning, professional education curricula need to be designed to foster the development of these abilities. While many professional education curricula identify continuing learning as an outcome competency (Boud & Feletti, 1991; Knapper & Cropley, 1985), few outline how the curricula assist students in becoming self directed (Mawby, 1986; Wilcox, 1996) and even fewer determine whether the graduates have developed the abilities to become self directed in their learning.

The rapid changes in health care, the diminished lifespan of useful information, and subsequently the increasing complexities of professional nursing practice make it essential that nurses continue to learn throughout their professional careers in order to maintain competence. The profession of nursing has a long history of recognizing the need for continuing learning. It was Florence Nightingale (1859) who first wrote that "we should be learning all our lives" (p. 75). The ability of the professional nurse to become self directed in continuing to learn is one way of ensuring continued competence in professional nursing practice. The accrediting body for Canadian university undergraduate nursing programs (CAUSN, 1995) and many of the provincial nursing associations (AARN, 2000) clearly indicate that professional education programs in nursing must be designed to expose student nurses to the strategies that can assist them to develop the abilities to become self directed in continuing to learn. Billue (1988) and French (1992) both indicate that most undergraduate nursing programs include an outcome competency related to continuing learning but seldom indicate how the curricula assists the students to achieve this outcome.

Within the health care disciplines, Problem Based Learning (PBL), with theoretical foundations in cognitive psychology, has been identified as one way to facilitate the development of abilities to become self directed in learning (Barrows, 1983; Dunlap, 1997; Ryan, 1993; Wood, 1995). Advocates of PBL argue that the development of the ability to become self directed in learning should be inextricably linked to professional development in the discipline (Barrows, 1986, 1988; Barrows & Tamblyn, 1980; Candy, 1991). Barrows (1983) further suggests that the development of the ability to be self directed in learning must be perfected through active, repeated and guided

practice associated in the learning process with the acquisition of disciplinary knowledge and skills. Problem based learning fosters the development of knowledge and skills within a professional discipline by utilizing authentic situations that have been encountered by professional practitioners as the initial stimulus for student learning activity. The deliberate process associated with PBL is characterized by the application of cognitive skills that include questioning, analyzing, searching for appropriate sources of information, iterative discussion, and synthesis of information as comprehensive concepts. Maximizing the possibilities of PBL requires that the student develop the ability to become self directed and indeed, considerable time and attention is devoted to the development of this ability as an active component of the process (Barrows, 1988). Throughout the process, the faculty tutors facilitate the development of the students' reasoning processes, guiding when necessary and challenging the depth and accuracy of understanding and application of concepts. However, there is little or no empirical evidence in the research literature confirming the link between PBL and the ability to be self directed in learning.

The ability to engage students in the process of PBL requires faculty to be committed to the notion of facilitating the development of the students' abilities to be self directed. There is some evidence to suggest that only a small percentage of university/college faculty do support the concept of self directed learning and in those cases, attempts to facilitate learning did not exemplify the strongly stated convictions of faculty (Grabove, 1994; Wilcox, 1996). There has been limited study of the influence of faculty characteristics on faculty's ability to facilitate self direction in learning in students. Alspach (1991) found an association between faculty readiness for self direction

and the frequency with which they provide opportunities for self direction among their students. Woods (1995) suggested that involvement as students in PBL may facilitate self directed learning readiness of faculty. Clearly, the area of instructional support for self directed learning requires further investigation.

Purpose of the Study

The purpose of this study was to learn more about the strategies that might facilitate the development of self directed learning readiness in undergraduate baccalaureate nursing students and to explore factors that might influence self directed readiness of these students.

Objective of the Study

The objectives of this study were to 1) determine the self directed readiness of baccalaureate nursing students and faculty at entry and at the end of one year in a PBL undergraduate nursing program and 2) identify factors which might have influenced their readiness.

Research Questions

This study addressed the following research questions:

1. What is the extent of self directed learning readiness of students at the beginning of an undergraduate nursing program that employs PBL?

2. What is the extent of self directed readiness of faculty at the beginning of an undergraduate nursing program that employs PBL?

3. What is the extent of self directed learning readiness of students at the end of one year in an undergraduate nursing program that employs PBL?

4. What is the extent of self directed readiness of faculty at the end of one year in

an undergraduate nursing program that employs PBL?

5. Is there an association between the opportunities provided for learner control in an undergraduate nursing program that employs PBL and self directed learning readiness?

6. Is there an association between learner responsibility in following through on opportunities provided in an undergraduate program that employs PBL and self directed learning readiness?

7. How do students describe their experiences with learner control and responsibility in an undergraduate program that employs PBL?

8. How do faculty describe their experiences with learner control and responsibility in an undergraduate program that employs PBL?

Definition of Terms

Following is a list of operational definitions used in this study:

Self directed learning is learning in which the learner assumes primary responsibility for planning, implementing and evaluating the learning process.

Learner control refers to the extent that learners control the following learning variables: identification of learning needs, topic and purpose of learning activity, expected outcomes, choice of learning experiences, evidence that outcomes were achieved, environment, resources, time, pace and methods of evaluation. It is measured as a percentage of time that learners feel they control these variables.

Learner responsibility refers to the willingness of the learner to enact the learning process. Learner responsibility is measured as the percentage of time that learners follow through on opportunities provided for learner control.

Self directed learning readiness refers to the extent to which individuals perceive themselves to possess the abilities, attitudes and personality characteristics associated with self direction in learning. Self directed learning readiness is measured as the score attained on Guglielmino's (1977/1978) Self Directed Learning Readiness Scale.

Self direction in learning refers to both the external characteristics of the learning process and the internal characteristics of the learner.

Problem based learning refers to learning that results from the process of working toward understanding a situation or resolving a problem. The situation or problem is encountered first in the learning process and serves as a stimulus for the search for knowledge to better understand the situation and the application of reasoning skills in the search for resolution or best outcome.

Significance of the Study

Hesburgh, Miller and Wharton (1974) suggested that the most essential goal of formal education is to inculcate students with an understanding that learning is continuous and that they must be self directed in their pursuit of continued learning. Although the responsibility for inculcating these attitudes rests with all levels of formal education, Hesburgh et al (1974, p. 13) contended that colleges and universities have a particular obligation in this regard: "The undergraduate is poorly served, indeed, unless he had developed confidence in his own ability to be a self learner and to participate effectively in the largely unstructured and unprogrammed educational opportunities that lie ahead for him as a professional person …"

Baccalaureate nursing graduates must enter their professional careers with the understanding and ability to engage in the continuous learning that is essential to ensure

continued competence in professional practice (AARN, 2000; CAUSN, 1995; Thomas, 1995). The professional nurse's ability to be self directed in learning is an important indication of the ability to pursue continuing learning as a professional concerned with maintaining professional competence (Clark, 1980; Cooper, 1983; Houle, 1980; Raudois, 1987; Toebe, Armstrong, & Watson, 1982). If students at the end of one year in an undergraduate baccalaureate program that employs PBL possess the attitudes, personality traits and abilities that constitute readiness for self direction in learning, they are more likely to be able to continue learning throughout their professional careers. Furthermore, if at the end of one year in an undergraduate program that employs PBL, students' and faculty's readiness for self direction in learning has increased, there will be further support for the contention that involvement in PBL facilitates self directed learning.

CHAPTER 2

Literature Review

Each profession holds an implicit contract with the society that it serves. This contract provides the profession with certain exclusive rights in exchange for the assurance of quality and effectiveness of professional service (Curry & Wergin, 1993). Because of the technical and complex nature of professional service, society has entrusted the accountability for professional competence to the professionals themselves. It has been suggested that one way to meet this obligation is for every professional to engage in continuous professional education (Clark, 1980; Houle, 1980; Oddi, 1988). In order to maximize continuous learning, professionals must be able to plan, manage and monitor their own learning. This means that professionals engaged in continuous learning must have the ability to be self directed.

Self Direction in Learning

The origins of self directed learning (SDL) can be traced to John Dewey who proposed that all persons are born with unlimited potential for growth and development. He defined education as the agency for that growth and cautioned that the teacher should be the one who guides but does not interfere with nor control the process of learning (Dewey, 1916, 1938). Contemporary adult learning theory which values a learner centered approach to adult education clearly reflects this humanistic philosophy. From this perspective, the focus of learning is on the individual and self development, with the learner expected to assume the primary responsibility for their own learning (Brockett & Hiemstra, 1991; Knowles, 1975; Long, 1992; Tough, 1979). The literature in education recommends that the learning experiences of adult learners actively involve learners in

the process, be characterized by collaborative faculty-student relationships and develop learners' capacities to manage their own learning.

Houle's (1961) work is credited with sparking the ongoing interest of researchers in investigating the extent to which people engage in self direction and their reasons for doing so. The term 'self directed learning' emerged in the general adult education literature in the mid-1970s with the work of Tough and Knowles who were students of Houle (Brockett & Heimstra, 1991). Tough's (1971) seminal learning project research demonstrated that the majority of adults naturally engage in self learning projects because of the benefits that they expect by doing so. Knowles subsequently based his andragogical model on the assumption that adult learners are self directing learners (Knowles, 1975, 1980).

Since the mid-70s, self directed learning has become a prominent feature of adult education, theory, practice, and research. The concept of self directed learning has undergone close scrutiny over the last two decades and three principal but distinct ideas have emerged from inquiry into the nature and processes of self directed learning: 1) that SDL is a self initiated process of learning that stresses the ability of individuals to plan and manage their own learning, 2) that SDL is an attribute or characteristic of learners and 3) that SDL is a way of organizing learning in formal settings that allows for greater learner control (Brockett & Hiemstra, 1991; Caffarella & O'Donnel, 1989; Caffarella, 1993; Candy, 1991).

A Process of Learning

The study of self directed learning has contributed to our understanding of learning by identifying an important feature of adult learning and providing insights into the process of adult learning. Researchers replicating Tough's original study have verified that a significant number of adults learn a great deal outside the confines and controls of a formal educational setting (Brookfield, 1984; Caffarella & O'Donnell, 1987). What differentiates this form of self directed learning from the learning that occurs in more formal settings is the notion that the learner chooses to assume primary responsibility for planning, following through and evaluating their own learning experiences (Brockett & Heimstra, 1991, Candy, 1991; Merriam & Caffarella, 1991).

The notion of personal responsibility has been described as the willingness to assume ownership of thoughts and actions and is considered the cornerstone of self direction in learning. In assuming responsibility for one's thoughts and actions, one also assumes responsibility for the consequences of those actions. Within the context of adult learning, it is the ability and willingness of individuals to take control over their own learning that determines their potential for self direction (Candy, 1991; Garrison, 1992). Adult learners will possess varying degrees of ability and willingness to accept responsibility for themselves as learners. Assuming primary responsibility for one's own learning does not necessarily imply solitary learning. Indeed adult learners often seek out assistance in the form of human or material resources. If personal responsibility within the context of adult learning is considered a dynamic characteristic then teachers can facilitate adult learners' abilities to assume increasing personal responsibility for their learning.

The process of SDL is typically conceptualized as a series of interrelated activities (Brockett & Heimstra, 1991; Barrows & Tamblyn, 1980; Barrows, 1983, 1986; Clark, 1980; Cooper, 1980; Martens, 1981; Rosendahl, 1974; Tough, 1971). Although the descriptions of the activities vary in number and wording, they commonly reflect Knowles's (1975, p. 18) original documentation of the process of SDL as: "a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes". This describes the notion of self directed learning as it is used in the professional education literature (Barrows & Tamblyn, 1980; Brockett & Heimstra, 1991; Cavanaugh, 1993).

A Learner Characteristic

Discussion about the salient characteristics of adult learners constitutes the second major contribution of the study of self directed learning to adult education. The central assumption underlying the work on learner characteristics is that adult learners strive toward self direction and autonomy (Candy, 1991; Chene, 1983; Kasworm, 1992; Knowles, 1980). That adults have a deep psychological need to be generally self directing is a major tenet explicit in Knowles's (1980) androgogical model of learning. This specific characteristic of adult learners has become the focus of many adult educators. Through various instructional processes, adult educators encourage and teach adults how to take increasing responsibility and control over their own learning (Caffarella, 1993).

The notion of autonomy is a key element in conceptualizing adults as self directed

learners. Autonomous learners are characterized as being independent, being able to make choices based on rational reflection, having a strong sense of personal values and beliefs and being able to tolerate ambiguity and diversity (Brockett & Heimstra, 1991; Candy, 1991; Chene, 1983; Garrison, 1992). These characteristics provide the foundation for carrying out the activities associated with self directed learning. Even autonomous learners, however, who can and desire to be self directed in learning may on occasion choose not to display or pursue self direction (Brockett & Heimstra, 1991; Candy, 1991; Knowles, 1975, 1980). Factors that influence autonomous learning include familiarity with content, technical skills, sense of personal competence as learners, and the context of the learning situation (Brockett & Heimstra, 1991; Candy, 1991; Pratt, 1988). Emphasis on the personality characteristics of the learner or factors internal to the individual has been referred to as learner self direction and refers to the characteristics of a person that predisposes that individual toward assuming primary responsibility for learning (Brockett & Heimstra, 1991).

Facilitation of Self Direction in Learning

Knowles (1975) and Tough (1979) were among the first to urge that facilitation of self direction in learning be incorporated into organized learning. Instructional facilitation includes providing learners with the opportunity and time to think about what it is they want or need to learn, how they will go about learning, what criteria they will use to determine whether learning outcomes are achieved and whether the process was satisfactory. The two major forms of facilitation that have been identified are differentiated on the basis of who controls the activities in the process (Brookfield, 1984; Clark, 1980; Cooper, 1983). Self or learner designed forms of SDL are those in which the

learner controls the majority of the activities in the learning process. Other designed forms of SDL reflect a situation where the majority of the activities in the learning process are controlled by someone other than the learner. Self direction in learning is a product of both the external characteristics of an instructional process and the internal characteristics of the learner, where the autonomous individual assumes primary responsibility for the learning experience (Brockett & Heimstra, 1991).

Measurement of Self Directed Learning

The current knowledge base of self direction in learning has evolved through the efforts of researchers creating strategies to answer questions about the nature of self directed learning. The first major branch of inquiry is associated with the methodology utilized initially by Tough in his work on adult learning projects (Tough, 1971, 1979). The second major branch of research is based on the notion of self directedness as a personality characteristic of the learner. Based on this approach, written instruments (Guglielmino, 1977; Oddi, 1986; Pillings-McCormick, 1997) are used to determine the extent to which individuals possess qualities associated with self directedness. A third approach to studying self direction in learning has employed primarily observation and interview in order to develop models that can help explain the meanings and contexts of self direction in learning during adulthood (Brookfield, 1981; Gibbons et al., 1980; Spear & Mocker, 1984). Each form of inquiry continues to serve an important function in addressing specific questions related to the construct of self direction in adult learning.

Tough's Interview Schedule

It is the work of Tough (1971) that initiated what is now almost three decades of inquiry in the area of self direction in learning. The cornerstone of Tough's work (1971,

p. 7) is the learning project which he defined as "a series of related episodes adding up to at least seven hours where more than half of the person's total motivation is to gain and retain fairly clear knowledge and skill or to produce some other lasting change in himself'. An episode is defined as "a period of time devoted to a cluster or sequence of similar or related activities, which is not interrupted much by other activities" (p.7). An episode has a distinct beginning and concluding time and the information has to be retained for at least 2 days after the learning activity has taken place. The "seven hours within a six month period" qualification was intended as a minimum expenditure of time. To obtain data Tough used a highly structured interview process. Interviewers were trained in how to use the interview format and in how to identify learning projects. There were points in the process where interviewers would share with subjects various "probe sheets" that prompted a recall of learning projects from a wide range of areas. Within ten years, more than fifty studies had been conducted using Tough's interview schedule (Brookfield, 1984).

Learning project research represented the first effort by adult education researchers to study the concept of self direction in learning in any systematic way. Furthermore, it offered a method of studying the learning efforts of individuals who preferred to engage in learning activities outside the formal educational institutional setting. Criticism of learning project research has focused on the potential for bias during the interview process (Brockett & Heimstra, 1991; Oddi, 1984). Learning project research was designed to explore the nature and frequency of learning project activity but not to assess the quality of or reason for such activity.

The Self Directed Learning Readiness Scale

Lucy Guglielmino (1977) made one of the first efforts to move beyond Tough's learning project methodology with the development of the Self Directed Learning Readiness Scale (SDLRS). The SDLRS was designed to assess the extent to which individuals perceive themselves to possess the skills and attitudes frequently associated with self directedness in learning. The instrument was designed through a three round Delphi survey process involving 14 experts in the area of self directed learning who were able to reach consensus on the most important personality characteristics of highly self directed learners. These personality characteristics were used to construct questionnaire items. A factor analysis of the questionnaire by Guglielmino (1977) yielded the following factors: love of learning; self concept as a self directed learner; tolerance of risk, ambiguity and complexity in learning; creativity; view of learning as lifelong; initiative in learning; self understanding; and acceptance of responsibility for own learning. Although Guglielmino urged caution in utilizing this factor structure, it is possible to recognize from these factors some of the attitudinal and personality factors that may be related to a tendency toward self directedness (Brockett & Heimstra, 1991).

Research literature on self directed learning reveals that the SDLRS has been utilized in two major ways (Brockett & Heimstra, 1991). First, it has been used to explore relationships between self directed readiness and other personal variables through experimental, quasi-experimental and correlational designs. Second, the SDLRS has been utilized as a diagnostic tool for assessing learner perceptions of their own readiness for self directed learning.

Since the development of the SDLRS, numerous studies have been conducted to determine the reliability and validity of the 58 item Likert scale instrument. In the most recent analysis of 3151 SDLRS test scores, a Pearson split-half reliability estimate of 0.94 was established (Guglielmino, Long & McCune, 1989). Construct validity of the SDLRS has been established in numerous studies (Long, 1987; Long & Agyekum, 1983, 1984; Hassan, 1981; Mourad & Torrance, 1979; Sabbaghian, 1979; Savoie, 1979).

The Oddi Continuing Learning Inventory

Oddi (1984, 1985) developed the Oddi Continuing Learning Inventory (OCLI) as an alternative measure for self direction in learning. Using a theoretical framework based on "personality characteristics of individuals whose learning behavior is characterized by initiative and persistence over time through a variety of learning modes" (Oddi, 1985 p.98), Oddi identified three clusters that she hypothesized to be essential personality dimensions of self directed continuing learners. The dimensions include proactive drive versus reactive drive, cognitive openness versus defensiveness, and commitment to learning versus apathy or aversion to learning. These dimensions were used to construct the initial 100 items that comprised the instrument.

Following content analysis by a panel of experts, the initial pool of 100 items was reduced to 65. After pre-pilot testing and item analysis, deletion of additional items resulted in an instrument of 31 items for pilot study. Item analysis of the data following the pilot study resulted in the deletion of 6 additional items, leaving 26 items with a raw score coefficient alpha of 0.75 (Oddi, 1984).

Validation of the instrument to obtain estimates of internal and external validity and reliability was accomplished through a study of the internal consistency and stability

of the instrument, factor analysis, and correlation of OCLI scores with four instruments (Leisure Activity Survey, Internal-External Scale, Shipley Institute of Living Scale, Adjective Checklist). Analysis for internal consistency revealed two items that did not correlate significantly with the total scale. The remaining 24 items of the OCLI demonstrated an internal consistency of 0.875 and a test-retest reliability of 0.893. Oddi (1986) concluded that the OCLI had satisfactory reliability and stability and was a valid instrument when used in its entirety.

The Self Directed Learning Perception Scale

The latest contribution to the measurement of self directed learning was made by Pilling-Cormick (1997). The Self Directed Learning Perception Scale (SDLPS) was designed to examine the characteristics in the learning situation that assist learners in directing their own learning. The emphasis is on the instructional facilitation rather than on the learner.

Based on a literature review, a profile of a self directed learning environment was designed. The resulting SDLP model provided the basis for the development of an instrument to study students' perceptions of the helpfulness of identified characteristics. A pre-pilot study was conducted. Content validity was established by a panel of typical respondents and a panel of content experts. The revised instrument was pilot tested and subsequently revised. A field test established an overall Cronbach-alpha coefficient of 0.93, suggesting a high degree of reliability. However, this is a new instrument and continued testing for reliability and validity is recommended (Pilling-Cormick, 1997).

Self Directed Learning in Continuing Nursing Education

Self directed learning activities have been advocated for continuing nursing education and have been incorporated into orientation and professional development programs for practicing nurses for several years (Hegge, 1985, Palank, 1982). The participation of graduate nurses in self directed professional learning activities has been well documented in the literature over the last two decades. Much of the reported participation of graduate nurses relates to other directed rather than self directed learning activities (Abruzzese, 1982; Clark, 1986; Cooper, 1980, Keeling & Noriega, 1978; Toebe, Armstrong & Watson, 1982).

The 1970s

Nurse researchers in the 1970s examined the extent of graduate nurses' participation in self directed learning and the various factors associated with participation in continuing learning. In the majority of these studies, self directed learning was conceptualized as a set of activities in the process of self instruction.

In a survey of 220 registered nurses, Clark and Dickinson (1976) investigated the extent that nurses participated in both other directed and self directed learning activities. Other directed activities included workshops and conferences while self directed activities involved self planning and managing learning situations such as reading professional journals or utilizing audio-visual materials for professional development. The findings revealed that nurses participated in at least one continuing education activity during the year, with a mean of 9.9 activities and a high of 17 activities. The nurses participated in more self directed activities than other directed activities at a statistically significant level.

Using a modified version of the Tough Interview Schedule, Moran (1977) studied 30 randomly selected staff nurses employed in a large teaching hospital. The mean amount of time spent in continuing professional education during the year prior to the study was 591 hours. The majority of these hours (469) were devoted to self directed continuing professional education activities. Significant relationships existed between the amount of self directed learning and several variables such as age, tenure on unit, plans for professional certification, a climate of support to pursue learning and perceived support of nursing supervisors and colleagues to utilize new knowledge and skills. For example, a younger nurse who had recently transferred to the unit with plans to pursue professional certification and who perceived herself to be working in an environment supportive of learning engaged in greater amounts of self directed learning.

The findings of Bell and Rix (1979) support those of Moran. Their investigation of 373 staff nurses also revealed greater participation in self directed professional continuing learning activities than in other directed learning activities. The most commonly employed forms of self directed learning for registered nurses in this study consisted of reading professional journals and consultation with colleagues (Abruzzese, 1982).

The 1980s and 1990s

The initial interest in describing the extent and nature of nurses' self directed learning has continued into the 1990s. However, many studies of the 1980s and 1990s have moved beyond a survey of incidence of self directed learning activity. Current investigations examine self direction as a personality construct, readiness for self direction in learning and factors affecting self direction in learning.

One of the earliest investigations using the SDLRS was conducted by Savoie (1980) who was interested in the possibility of predicting success in continuing education courses for nurses where learners were expected to assume a high degree of self direction. Savoie administered the SDLRS and a biographical questionnaire to 152 nurses enrolled in a continuing education course. A significant positive relationship between SDLRS scores and course grades was found. Savoie also noted a relationship between self directed learning readiness and the individuals' self concept as self directed learners, a finding supported by other studies (Brockett, 1985; Sabbaghian, 1980).

The relationship among involvement in self directed learning, locus of control and measured self directed learning readiness was investigated by Skaggs (1981). Self directed readiness was measured using the SDLRS in a randomly selected sample of registered nurses. Scores on the SDLRS correlated significantly with the hours that nurses devoted to self directed learning. Readiness for self directed learning also correlated positively with an internal locus of control.

Graeves (1987) studied registered nurses' patterns of self directed learning and found that nurses reported spending significantly more time in self directed than teacher directed learning. A significant relationship was found between SDLRS scores and the number of hours engaged in self directed learning, a finding that lends further support to the Hassan (1982) and Hall-Johnson (1985) studies. The most recent study to determine the amount of time nurses spend in self directed learning activities and the relationship of this to scores on the SDLRS was conducted by Dixon (1991). The nurses in Dixon's study spent on average 120 hours in self directed learning over a six month period.

However, the hours spent in self directed learning did not correlate significantly with SDLRS scores.

One additional study examining self directed learning readiness in registered nurses has been reported. Moore (1988) investigated predictors of success in home study nursing courses. In a study of 121 nurses, SDLRS scores did not correlate significantly with final course grade, a finding also supported by Russell (1990). Moore (1988) noted that the sample included nurses who were not only highly self directed and highly motivated but who also answered most of the test items correctly. This could have limited any possible correlation between the criterion and predictor variables.

O'Connor (1982) studied the reasons nurses participated in self study continuing education programs. Using Boshier's Education Participation Scale, O' Connor surveyed 1700 nurses who participated in four self study continuing education programs offered through the American Journal of Nursing. O'Connor found that participation in programs was influenced most strongly by reasons related to improving professional knowledge and skills, seeking professional advancement, and improving effectiveness of professional practice. These findings are supported by those of Millonig (1985) who studied a random sample of 350 registered nurses using the same instrument.

Toebe, Armstrong and Watson (1982) utilized a specific self study continuing education course to identify what factors influenced participation in and completion of the course. Using a survey to collect data, the researchers found supporting evidence that nurses engage in self directed learning more for reasons of personal satisfaction and need for knowledge than employer requirements. Study habits and personal motivation factors

positively affected course completion whereas study groups, established deadlines and previous self study course work did not.

Self Directed Learning in Baccalaureate Nursing Education

The earliest investigation using SDLRS with nursing students was a study conducted by Wiley (1982). Using a nonequivalent, control group design, Wiley (1982) examined the effects of a 12 hour process oriented, self directed learning project and personal preference for structure on self directed learning readiness of 104 junior nursing students. The SDLRS was used as a pre test for both control and experimental groups along with Ginther's Reaction to Statements, a measure of preference for structure. The experimental group then participated in the learning process experience and both groups received the SDLRS as a post test. Wiley concluded that neither the self directed learning project nor preference for structure singularly affected overall SDLRS scores. The students who experienced the self directed learning project and gained in SDLRS scores preferred low structure while those students who experienced the self directed learning project and preferred high structure had a decrease in SDLRS scores. Similar findings were also reported by Russell (1990). Based on these results, Wiley suggests that a self directed learning project is useful for learners who prefer low structure. It could be that students who prefer high structure may benefit from assistance in self structuring in addition to the self directed learning project process.

Box (1983) studied the differences among first level students, second level students and graduates of an associate degree nursing program. Although Box did not find any significant differences in SDLRS scores among the three groups based on the data of 477 respondents, she did note a significant correlation between SDLRS scores and

grade point average which corroborates Savoie's (1979) findings. However, O'Kell (1988) using a cross-sectional study of 158 baccalaureate student nurses found that SDLRS scores decreased with each successive year of the program. These results reflect the findings of Diers (1972) who stated that traditional professional education programs for nurses "trains out" the qualities of independence in nursing students.

Murray (1988) used a quasi-experimental design to investigate the effect of a clinical internship on the self directed learning readiness of baccalaureate students. Murray found that there was a significant difference between pre test and post test scores for those students who participated in the clinical internship. Higher SDLRS scores were related to higher grade point averages and plans for advanced education in nursing. Dobbie and Karlinsky (1982) and Anderson (1996), using descriptive retrospective designs, reported high levels of satisfaction among nursing students involved in self directed clinical practicum experiences.

Crook (1985) was interested in exploring the predictive validity of the SDLRS. Like Savoie (1980), Crook wanted to determine the extent to which SDLRS scores could predict success. The SDLRS was completed by 63 first year nursing students at the beginning of the program. At the end of the first academic year, students and faculty were asked to identify the most effective self directed learners in their small study groups. A significantly positive correlation was found between SDLRS scores and peer nomination and end of year grades. However, the correlations explained such a small percentage of the variance that Crook could not recommend the use of the SDLRS scores for the purposes of predicting success or failure.

Like Murray (1988), Palumbo (1990) employed a pre test post test design to measure SDLRS over a period of one and one-half years. In this study, a group of 45 registered nurses studying for a baccalaureate degree demonstrated significant increases in SDLRS scores. Alspach (1991) and Eyer (1992) also investigated the self directed readiness of senior baccalaureate nursing students. Using a convenience sample of 357 senior nursing students, Alspach found that the group had above average SDLRS scores. Students who already had a baccalaureate degree in a field other than nursing had the highest degree of readiness for SDL. Registered nurses completing a baccalaureate degree had the next highest SDLRS scores while generic nursing students had the lowest SDLRS scores. Eyer (1992) reports similar findings using a convenience sample of 135 senior nursing students and the OCLI. In addition, Alspach examined the self directed learning readiness of the program faculty. She concluded that the 86 program faculty had a higher degree of readiness for self directed learning than the senior nursing students. Most recently, Barnes (1999) examined the relationship between curiosity and SDL and reported a significant relationship among the three sub-elements of curiosity and SDLRS scores.

From these studies, it is obvious that self directed learning readiness is viewed as an important concept in the study of adult learning among nurses. Although continuous learning and self directed learning in particular are considered integral to the education of professional nurses (Clark, 1980; Clark & Dickinson, 1976; Cooper, 1983; Dear & Bartol, 1984; Ferrell, 1978; French, 1992; Moran, 1977; Richardson, 1987), most programs of basic professional education remain largely teacher directed, fact oriented and lack inclusion of activities designed to facilitate the development of self directed

learning abilities (Bell & Rix, 1979; Billue, 1988; Christman, 1987; Coombe et al., 1981; Davidhizar, 1982; Diers, 1972; French, 1992; Littwick, 1971; Moran, 1977; Raudonis, 1987; Toebe et al., 1982).

Increasingly, attempts are being made to introduce self directed learning into basic professional nursing education programs (Bell & Bell, 1983; Coombe et al., 1981; Dear & Bartol, 1984; Dobbie & Karlinsky, 1982; Dyck, 1986; Ferrell, 1978; French, 1992; Iwasiw, 1987; Long & Barnes,1996; Richardson, 1987; Ryan, 1993; Sommerfeld & Hughes, 1980; Wiley, 1983). These efforts often consist primarily of other designed rather than self designed learning. Programs that reflect a modification of teaching methods have replaced or reduced the information giving lecture with methods that require the learner to locate and apply information relevant to their professional learning needs. These endeavors include the institution of a Problem Based Learning (PBL) curriculum with small group learning and self directed study (Andrews & Jones, 1996; Creedy & Hand, 1994; Dunlap, 1997, Glen, 1994; Heliker, 1994; McMillan & Dwyer, 1989; Newman, 1986; Ryan, 1993; Townsend, 1990).

Problem Based Learning

Students exposed to Problem Based Learning (PBL) instructional methodology acquire knowledge and skill within a disciplinary domain by encountering key professional practice situations as the stimulus and focus of their learning activity (Barrows, 1980, 1983, 1985; Boud & Feletti, 1991). Advocates of PBL suggest that PBL fulfills distinct educational outcomes (Barrows, 1985, 1986; Gijselaers, 1996; Savery & Duffy, 1995) in that students acquire an essential body of retrievable and useable knowledge and skills, are able to transfer their knowledge and skills effectively to deal

with a variety of situations, and develop continuous learning skills to extend or improve their knowledge base in order to remain professionally competent.

In order to meet these educational outcomes, PBL instructional methodology uses professional practice situations as the catalyst for learning. This varies from conventional instructional methodology which relies on the use of professional practice situations as a culminating activity that follows faculty presentation of content. In a PBL learning environment, the faculty present students with authentic, loosely structured practice situations before they receive any instruction. Students learn the content and skills associated with their chosen discipline in a context that is similar to what they will encounter as graduates in professional practice. Students engaged in PBL investigate situations, searching for connections across disciplines, grappling with the complexity of the situation while using existing and newly acquired knowledge to generate possible outcomes of the situation. During the process, students build substantial knowledge and skill bases through increasingly self directed study. Through collaboration with classmates, students refine and enhance their knowledge and skills. When possible outcomes have been identified, students present, justify and debate each possibility, searching for the best possible outcome of the situation.

In a PBL learning environment, students work with situations in a way that fosters reasoning, knowledge and skill application congruent with their level of learning. During the process of working on a situation with their peers, students identify areas of learning that will guide their own individualized study. The knowledge and skills acquired through individual study are applied to the situation and evaluated for effectiveness

thereby reinforcing self directed learning. The learning is subsequently integrated into the student's existing knowledge structure.

Theoretical Foundations of Problem Based Learning

Recognizing that conventional classroom instruction was not completely preparing medical students to transfer the knowledge and skills learned in school to the demands of medical practice, McMaster medical school faculty designed a PBL curriculum (Barrow, 1986; Walton & Matthews, 1989). While these endeavors were developed by medical faculty based more on ramifications for professional practice than on any specific existing theoretical support, they did reflect the theoretical perspectives of cognitive science, particularly the contributions of Dewey, Bruner, and Piaget (Norman & Schmidt, 1992; Schmidt, 1983, 1993; Wilkerson & Feletti, 1989). Within the cognitive science domain, PBL reflects both the rationalist (information processing) view of learning (Albanese & Mitchell, 1993; Norman & Schmidt, 1992; Schmidt, 1983, 1993) and constructivist views of learning (Savery & Duffy, 1995), based on the assumptions that in facilitating certain learning activities which enable students to apply what they learn, inert knowledge is not acquired (Schmidt, 1983).

Rationalist Perspective

A rationalist perspective of learning assumes that knowledge acquisition is primarily a result of individual cognitive activity (Schmidt, 1993). Dewey (1938) suggested that knowledge cannot be simply transferred from one individual to another. It can only be acquired through active cognitive engagement. According to a rationalist perspective, existing cognitive structures within the individual will influence the extent to which new information will be understood. Bruner (1961) suggested that in general,

material that is organized according to the individual's own interests and cognitive structures is material that has the best chance of being accessible to the individual's memory. The assumption that knowledge acquisition is a result of cognitive activity is foundational to the information processing perspective of cognition which focuses on the processing, storage and retrieval of information (Slavin, 1994) as well as its cognitive representation. The information processing perspective also reflects Piaget's description of cognition with the addition of the notion that thinking skills can be directly taught (Slavin, 1994).

Schmidt (1983, 1993) described six principles of PBL instructional methodology that reflect an information processing perspective of cognition. The following principles reflect the information processing concepts of long term memory, schemata and semantic networks and meaningful learning to counter the development of inert knowledge:

(1) The amount of existing prior knowledge is the key determinant of the amount of new information that can be processed. Prior knowledge and its structure in long term memory determines what is understood from instruction and defines what is learned from that instruction.

(2) In order to understand and remember new information, prior knowledge needs to be activated by cues embedded in the context in which the information is being presented. Existing knowledge must be activated to enable the interpretation of newly acquired information so that it can be added to the existing knowledge structure.

(3) Knowledge is structured, therefore, accessibility of knowledge is based on how it is structured in memory. Human learning requires the construction of organized schemata for sorting, retaining and retrieving memories.

(4) Elaboration on the information improves the storing and retrieving of information from memory. Understanding is more likely to occur when individuals actively transform information and integrate it into existing cognitive structures. Elaboration includes writing summaries, discussing information with peers, teaching peers what has been learned and formulating and criticizing hypotheses for a situation under study. Elaboration provides redundancy in the memory structure and redundancy acts not only as a safeguard against forgetting but also as an aid to rapid retrieval.

(5) The successful future retrieval of information depends on encoding retrieval cues that are to reactivate the information along with the information that is being learned. In other words, the closer the learning situation resembles the situation in which the information is to be applied, the better the retrieval of the information is likely to be.

(6) Motivation is intertwined with effectiveness and learner performance. Processing time is prolonged and achievement is improved through motivation. Motivation increases with intrinsic interest in the information. Confrontation with meaningful but poorly understood situations enhances interest and subsequently, motivation (Norman & Schmidt, 1992)

Based on assumptions associated with the information processing perspective of cognition and learning, a PBL activity employs the following instructional strategies and tactics (Schmidt, 1993):

(1) Relevant prior knowledge is activated by engaging students in practical situational analysis initiated with articulation about what they do and do not know about the situation.

(2) Elaboration on prior knowledge occurs through engagement of students in small group discussion, generation and critique of hypotheses and peer teaching. During the review process that occurs at the completion of each practical situation discussion, students elaborate further on the relationship of new knowledge to prior knowledge.

(3) Because the practical situation drives the learning of content and skills, students are continuously restructuring their knowledge as they work towards the best outcome.

(4) Authentic practical situations that reflect the types of situations students will face as professionals serve as the framework for storing contextual cues, improving students' abilities to retrieve relevant knowledge when faced with similar situations in the future.

(5) Students are motivated and spend more time processing information when they are discussing authentic practical situations which they perceive as relevant and meaningful. Increased time spent processing information results in a more complete cognitive structure from which to retrieve information (Albanese & Mitchell, 1993).

From a rationalist perspective of learning, PBL utilizes instructional strategies to assist students to process and store knowledge in such a way that it can be easily retrieved when required in the future. By helping students to activate prior knowledge, connect new knowledge to prior knowledge, elaborate on knowledge to create strong multiple connections in memory and structure knowledge with contextual cues, PBL addresses the issue of inert knowledge and enables students to apply what they have learned to similar situations that they might encounter in the future.

Constructivist Perspective

The constructivist perspective of learning assumes that knowledge acquisition is a continuous process of building and reshaping understanding as a natural consequence of experience in the world (Savery & Duffy, 1995). Learning is not about the acquisition of new knowledge but the constant reconstruction of what an individual already knows. The stimulus for learning is a cognitive conflict or puzzlement (Dewey, 1938; Savery & Duffy, 1995). Accordingly, learners must constantly check new information against existing information and adjust accordingly.

In addition to being a continuous process, learning is also described as a collaborative process in which the individual understanding has its roots in social interaction. Accordingly, knowledge acquisition is firmly embedded in the social and emotional context in which learning takes place. Conceptual growth arises from sharing perspectives and testing ideas with others. Such negotiation culminates in modifications in cognitive structure.

Savery and Duffy (1995) present principles that govern the design of PBL based on the constructivist perspective of cognition. The principles are based on the following

constructivist concepts of cognitive conflict, understanding through interaction, and social negotiation:

(1) Learning activities should be anchored to a larger context to avoid the acquisition of inert knowledge. There is an established purpose to the learning activity and a relevance that is clear to students.

(2) Students should assume ownership of the situation under study to ensure relevance and to develop self directed learning skills. When students assume ownership, learning goals are established based on cognitive conflict and that becomes the stimulus for knowledge acquisition.

(3) Knowledge is in part a product of the activity and context in which it is developed and used. Understanding is developed as a natural consequence of interaction with the environment. Therefore, learning activities should reflect the practice situations students are likely to face in professional practice.

(4) Since knowledge is socially negotiated, learning activities should encourage collaboration to provide students with opportunities to test their ideas against those of their classmates.

(5) Opportunities to reflect on the learning process and knowledge acquired should be embedded in learning activities to promote the development of metacognitive skills.

Based on the assumptions of a constructivist perspective of cognition and learning, PBL activity employs the following instructional strategies and tactics:

1) Learning is essentially an act of active construction on the part of the student (Savery & Duffy, 1995). By requiring students to assume the role of professional

and engage in self directed learning, students experience the knowledge construction process.

(2) Through collaborative group work and accessing a wide variety of resources, students experience and develop an appreciation for multiple perspectives.

(3) Learning is embedded in authentic contexts so students acquire content and skills through the discussion of actual professional practice situations. This strategy enhances the retrievability of knowledge when it is needed.

(4) Students assume responsibility for their own learning through self directed learning activities inherent in every PBL activity.

(5) Self awareness of the knowledge construction process, a key element of the constructivist perspective, is encouraged during the reflective activities embedded in each PBL activity and during the review process that occurs with the completion of the situation.

From a constructivist perspective, PBL prepares students for professional practice by engaging them in authentic activities during their learning for that practice. Knowledge and skills are learned within a context that reflects the professional context within which they will practice as professionals. Contextualization of learning and the social support and interaction during learning help prepare students to transfer what they have learned to new situations and avoid the pitfalls of inert knowledge. Specific instructional strategies proposed by proponents of both rationalist and constructivist perspectives to address the outcome of continuous learning include aspects of student self awareness, autonomy and responsibility, interaction and collaboration, and reflection and review.

Theoretical Links between Problem Based Learning and Self Directed Learning

The development of continuous learning skills is an essential educational outcome of PBL (Barrows, 1983, 1986). Branda (1990) states that SDL is an integral part of PBL; in fact, PBL cannot occur in the absence of SDL. Barrows (1983) indicates that PBL facilitates the development of SDL abilities during each phase of the PBL process.

In phase 1 of the PBL process students reason aloud through discussing the situation, identifying what they do and do not know, formulating hypotheses, clarifying understanding through negotiation, critiquing classmates comments, establishing educational goals and creating an action plan to meet those goals. With tutor coaching, these activities assist the students to develop self monitoring skills necessary to identify learning needs by revealing their internal thinking processes. The development of self monitoring skills is an important part of developing the skills associated with metacognition. It is these skills that contribute to the students' abilities to be continuing professional learners.

During the second phase of PBL, students activate their plans by engaging in self directed study. Students determine how they will learn the knowledge and skills that they have identified that they need and what resources they will use to assist them. This process assists students to develop the self directed learning skills which are a critical component of continuous professional learning.

During phase 3 students apply the information acquired during self study to the discussion of the situation. Students critique not only resources utilized during self study but also personal research methods. By critiquing methods and resources, students gain insight into what research methods were productive and why, what resources were

valuable and why, what research methods and resources were not effective and why, and what could be altered for the future. Ongoing evaluation of research methods and resources is critical in the process of continuous learning.

During the final phase of learning, students summarize what they have learned and discuss how their knowledge and skills might be used in future practice. Students consciously recall and reflect on learning that occurred, elaborate on the learning and integrate it into their existing cognitive structures (Barrows, 1983, 1986).

According to Barrows (1985), this process of situational analysis, learning needs determination, self study, application of knowledge, critiquing of resources and personal problem solving processes, and reflection of what was learned during the activity develops the students' abilities to be self directed in their learning. The PBL process engages students in activities that reveal their thinking processes so that they can monitor the effectiveness of their ability to analyze, reason, and acquire knowledge and thereby enables them to assume increasing responsibility for their own learning. However there is little empirical research evident in the literature confirming the link between PBL and the ability to be self directed in learning.

Empirical Evidence

Self reports to investigate the impact of PBL on various outcomes associated with self directed learning have been reported in the literature (Saunders, Northup, & Menin, 1985; Blumberg & Michael, 1992). The findings of these studies suggest that PBL and conventional students tend to study differently. PBL students are less likely to study for short term recall and more likely to study for understanding or to analyze what they need to know for a given situation and study accordingly. They control a substantially greater

degree of their learning efforts which is consistent with the reduced amount of scheduled class time. PBL students are also more likely to use library resources to study than conventional students.

Using a self rating scale adapted from Knowles (1975), Ryan (1993) examined the perceptions of students about their self directed learning abilities during a specific university course. The course employed PBL and one of the published outcomes of the course was the development of self directed learning ability. The results indicated significant changes in the students' perceptions of the importance of self directed learning and highly significant changes in their perceptions of their own abilities as self directed learners.

Shin, Haynes and Johnston (1993) investigated practicing physicians' knowledge of current clinical practice guidelines related to management of hypertension. The random sample were graduates from either a conventional medical program or a self directed, problem based medical program. The findings indicated that the graduates of the self directed program were more up to date in knowledge of the management of hypertension than graduates of the conventional curriculum.

Wood (1995) examined the impact of a problem based learning course on the self directed learning orientation of beginning nursing faculty. Using a collective case study method, Wood concluded that the experience of problem based learning as a student facilitated the self directed learning readiness of beginning faculty. Dunlap (1996), used qualitative journal analysis and a survey questionnaire to examine the effects of PBL on lifelong learning. The subjects were students enrolled in a university computing course that employed PBL. Dunlap's results indicated that students' intentions to utilize self

directed learning skills are related to and are a predictor of their intentions to engage in lifelong learning.

Summary

The literature supports the notion that it is essential that professional nursing practitioners engage in continuous professional education. It is also clear that if professional nurses are to maximize continuous learning, they need to be able to manage and monitor their own learning. This means that professionals engaged in continuous learning should have the ability to be self directed. The use of PBL as an instructional methodology in undergraduate nursing curricula has been identified as one way to facilitate the development of nursing students' ability to become self directed in learning.

CHAPTER 3

Method and Procedures

The purpose of this quasi-experimental study was to examine the self directed learning readiness of baccalaureate students and faculty at the beginning and at the end of one year in a PBL nursing program and to identify factors which might influence this readiness using quantitative and qualitative methods. Some of the factors which could influence self directed readiness include the type of nursing student, the self directed readiness of their faculty, and the characteristics of opportunities for self directed learning that are provided in the educational program.

Sample

The sample consisted of all the nursing students enrolled in and all the faculty involved in tutoring in the first year of the undergraduate baccalaureate program at a large Canadian university. Baccalaureate students may be classified in different ways: generic students who are typically 18 to 21 years old and completing a four year undergraduate program in nursing, students who have completed some courses in college or other university faculties, high school graduates who have varying degrees of work experience, and students who already have a bachelor's degree in a field other than nursing. The latter type of nursing student may take less time to complete their baccalaureate degree in nursing as the nursing program will generally allow transfer credit for courses taken previously which meet the requirements for the undergraduate nursing program.

Faculty involved in tutoring in the first year of the undergraduate nursing program

could have a variety of educational credentials: at a minimum, faculty would have a bachelor's degree in nursing, the majority would have a master's degree, and a few would have a doctoral degree. These later degrees would have been earned in nursing or a related discipline such as education.

Learning Environment

The term 'problem' has raised concern with this faculty of nursing as it implies that nursing consists exclusively of dealing with problems thereby overemphasizing illness rather than health, difficulties rather than strengths and problem solution rather than problem exploration. Within the PBL approach, however, the term "problem" is intended to refer to any situation relevant to learning to become a professional practitioner. This faculty of nursing has chosen the alternate term 'context based learning' in an attempt to reflect the wholistic nature of nursing practice. While other nursing faculties have also chosen alternate labels for their programs the general consensus in the literature is that the term 'problem' best describes the beginning point for the learning process (Rideout, 2000). For the purposes of this study, the generic term 'PBL' has been used.

At the time of the study, the nursing program was in its third year of implementing a hybrid model of PBL. The specific hybrid model of PBL used by this faculty of nursing is a structure where nursing course content is completely integrated and support course content is offered concurrently in a traditional didactic manner. A program brochure contains a description of PBL which emphasizes that learning within the nursing courses occurs in small groups and is based on systematic exploration of situations typically encountered in professional nursing practice. The first semester PBL

nursing course was comprised of five learning packages which students explored over a ten week period. Each learning package included associated laboratory skill learning. This course was followed by a four week clinical practicum. The second semester PBL nursing course was comprised of five learning packages with accompanying labs and extended over a six week period of time either before or after a six week clinical practicum. Simultaneously, students continued to learn support course content (Psychology, Sociology, Anatomy and Physiology) during 1-11/2 hour sessions each week throughout both terms.

Allocation to tutorial groups was arbitrary as it occurred through the traditional university system of registration. Tutorial groups consisted of eight to ten students and a faculty tutor. Typically, tutorial groups met for two hours on Tuesday, Wednesday and Friday of each week during both PBL nursing courses offered during first year. One or two tutors met with their tutorial groups for three hours twice a week, usually on non-consecutive days. The course syllabi which contained the objectives for the PBL nursing courses, explanations of student and faculty roles during tutorial and criteria for student participation during tutorial were purchased by the students at the beginning of the first week of the course.

Each learning package consisted of some general learning goals, a brief description of an authentic nursing practice situation and a variety of suggested resources for relevant support course concepts inherent in the situation. During initial tutorials, student learning was stimulated by "brainstorming" or verbal exploration of the situation outlined in the learning package. Existing knowledge about the situation was discussed and through guiding and challenging questions from the tutor, deficits in learning were

identified. With further tutor guidance students were able to clearly identify their learning needs and discuss relevant resources that could be used to help them learn unfamiliar information. Students used the learning time between one tutorial and the next to engage in self directed study, exploring issues either in pairs or independently.

During a follow-up tutorial new information was shared and discussed in relation to the situation identified in the learning package. This process provided an opportunity to evaluate the quality of the information, credibility of resources used to retrieve the information, creativity used in sharing the information and the students' understanding of the situation and their role as professional nurses within the situation.

An optional weekly resource session which took the form of a guest/faculty lecture was offered to students. These sessions provided an opportunity for students to extend their knowledge about the particular situation under study and students often brought specific queries prompted by the current situation under discussion.

Subsequent to the discussion associated with a single learning package (usually weekly), students engaged in self reflection and reflection on peer and tutor participation in the tutorial process. Following tutor role modeling, students were encouraged to offer constructive criticism of themselves and their colleagues in the areas of critical thinking, responsibility, communication, self awareness and respect for others in the learning group. The tutor would typically role model this approach to learning for the first learning package. For subsequent learning packages, students were coached to assume responsibility for facilitating the tutorial process which included initial discussion and brainstorming, subsequent follow-up discussion and peer/tutor feedback.

Ethical Considerations

At the time of the study, the researcher was a tutor in year three of the program. The researcher had contact with the first year students only for the purpose of data collection at the beginning and end of the first year of the program. Ethical approval for the study was granted by the Health Ethics Review Board of the Regional Health Authority. In addition, the rights of students and faculty were protected in several other ways. The researcher was not involved in teaching the students. Participation was entirely voluntary. Students and faculty had the opportunity to determine their willingness to participate in the research project in the absence of the researcher. While the risks were minimal to nonexistent, the benefits to the individual participant were also minimal. The list of code numbers and associated names were kept separate from the actual data and only consulted to prepare the questionnaires for the end of program. Before participating in a focus group interview, participants from both faculty and student groups were asked to sign a group agreement for maintaining confidentiality. To protect confidentiality, quotations were not assigned identities. Transcripts, tapes and completed questionnaires were stored in a locked filing cabinet in the Faculty of Nursing. Only the researcher had access to the raw data. Data analysis expresses group information rather than individual information. Any proposed future use of the data in a different context would require individual ethics review. It is anticipated that the findings will be published in a peer reviewed journal with a demonstrated interest in research related to the topic of nursing education.

Instruments

Two research instruments were used for data collection on entry to the nursing program: a student questionnaire (Appendix A) and a faculty questionnaire (Appendix B). Both questionnaires consist of two parts: biographical data and Guglielmino's Self Directed Learning Readiness Scale (SDLRS). Additional research instruments were used for data collection at the end of one year in the nursing program: opportunities experienced and followed through (student version - Appendix C) and opportunities provided and followed through (faculty version- Appendix D) for self directed learning (SDL). Formats for the questions included checklists as well as open ended and forced choice questions. The questionnaires were deliberately kept short in order to encourage participation.

Entry Questionnaire: Part 1

Part 1 of the student questionnaire was designed to elicit biographical information related to a number of reported correlates to scores on the SDLRS. This information included the age, sex, and level of academic achievement of respondents. Part 1 of the faculty questionnaire requested the following information: age, sex, years of teaching experience, level of education, year of graduation from baccalaureate, master's and doctoral programs, and the type of doctorate possessed.

Entry Questionnaire: Part 2 and Completion Questionnaire: Part 1

Part 2 of both the student and faculty entry questionnaires and Part 1 of the student and faculty completion questionnaires consisted of the Self Directed Learning Readiness Scale. The SDLRS is a self report questionnaire with 58 likert type items (1=almost never true of me; I hardly ever feel this way to 5=almost always true of me;

there are very few times when I don't feel this way) designed to determine the extent to which individuals perceive themselves as possessing the skills and attitudes associated with self directed learning. Five forms of the test are available: forms for the general adult population, for adults with low reading levels (or non native English speakers), for business, for children and a self scoring version. The forms for the general adult population of the SDLRS were employed in this study.

The SDLRS test results are an overall score of self directed learning readiness which ranges from a low of 58 (indicating a low level of ability to direct one's own learning) to a high of 290 (indicating a high level of ability to direct one's own learning). In addition, the test is scored for the following eight factors which were determined (via factor analysis) to be related to self direction in learning: love of learning; self concept as an effective, independent learner; tolerance for risk, ambiguity and complexity in learning; creativity; view of learning as a lifelong, beneficial process; initiative in learning; self understanding; and acceptance of responsibility for one's own learning.

Extensive testing of validity and reliability has been conducted on the SDLRS. The reliability of the SDLRS has been assessed most often through such measures of internal consistency as the split-half and coefficient alpha estimates. The initial version of the SDLRS was reported to have a reliability estimate of .87 (Guglielmino, 1977, 1978). Most published studies have reported similar figures. Brockett (1985), Graeve (1987), Hall-Johnson (1985), and Hassan (1981/82) also reported Cronbach-alpha coefficients of .87. Finestone (1984) and Skaggs (1981) reported a Cronbach-alpha coefficient of .92 and Hassan (1981/82) also reported a split-half reliability coefficient of .92. Finestone (1984) and Wiley (1981) reported test-retest reliability coefficients of .82 and .79

respectively. Additional support for the instrument's internal consistency is provided by Morris (1997) who reported that all SDLRS items correlated significantly to the total score. In the most recent analysis of 3151 SDLRS test scores, a Pearson split-half reliability estimate of 0.94 was established (Guglielmino, Long, & McCune, 1989).

There are different kinds of evidence which can be gathered to support the validity of an instrument. Cronbach (1980) and Messick (1989) asserted that all validity evidence is construct validity evidence. Many researchers who have explored the validity of the SDLRS have sought several different types of validity evidence.

Content validity is the degree to which the sample of test items represents the content that the test is designed to measure. Expert judgement is commonly used to ascertain whether an instrument has content validity (Gall, Borg & Gall, 1996). Content validity of the test was initially established through cooperation of fourteen nationally recognized authorities in self directed learning who participated in a three round Delphi study on the attributes considered to be important for self directed learning. Outcomes of the Delphi study resulted in the development of the SDLRS items (Guglielmino, 1977/1978).

While noting that a variety of procedures may be used to establish the construct validity of a test, Gall et al. (1996) reported that in order to gather evidence on construct validity, the test developer often begins by setting up hypotheses about the characteristics of persons who obtain high scores on the measure as opposed to those who obtain low scores. The developer then proceeds to determine if the hypotheses are supported. In the case of the SDLRS, a wide variety of hypotheses have been proposed and researched. Hall-Johnsen (1985.86) reported positive correlations between SDLRS scores and total

number of learning projects (r= .50; p< .01); number of self planned projects (r= .30; p< .05); time spent on self planned projects (r= .49; p< .01) and time spent on all learning projects (r= .50; p< .01). Hassan (1981/82) also reported a significant positive relationship between SDLRS scores and total number of learning projects undertaken (r= .34; p< .01). Posner (1989/90/91) found positive correlations between SDLRS scores and preference for challenge (.81), curiosity for learning (.79) and perceived scholastic competence (.69). Jones (1989/90) found a significant positive relationship between SDLRS scores (obtained before the observation of behaviors but not known to the observer) and observable student behaviors related to self directed learning readiness (r= .48; p< .01). Russell (1988/89) found a significant inverse linear relationship between preference for structure and readiness for self directed learning as measured by the SDLRS (r= .30; p< .027). Skaggs reported a positive correlation between SDLRS scores and internal locus of control (r= .32; p< .001). A meta-analysis of 29 research studies (McCune, Guglielmino, & Garcia, 1990) revealed a negative correlation with dependence (-.124) which was more pronounced for those with higher SDLRS scores (-.886). Overall, the validity studies have demonstrated a definite positive relationship between the SDLRS scores and observable indicators of self directed learning (Delahaye & Smith, 1995) if the instrument is used with a sample similar to the samples with which the instrument has been used in the past. The evidence supporting the reliability and validity of the SDLRS reinforces the position that the SDLRS is an appropriate instrument for measuring self directed learning readiness in educated adults (Morris, 1997).

The SDLRS had been used extensively with nursing students (Barnes & Morris, 1999; Barnes, 1999; Box, 1983; Crook, 1985; O'Kell, 1988, Wiley, 1982), registered

nurses (Box, 1983; Greave, 1987; Savoie, 1979; Skaggs, 1981) and college students (Caffarella & Caffarella, 1984; Sabbaghian, 1980 & Young, 1986). Relationships have been established between the SDLRS scores and age (Long & Agyekum, 1983; Sabbaghian, 1980); gender (Curry, 1983; Finestone, 1985; Sabbaghian, 1980); race (Long, 1989); marital status (Curry, 1983); educational level (Box, 1983; Curry, 1983; Guglielmino & Guglielmino, 1983; Leeb, 1984: Long & Agyekum, 1983; Sabbaghian, 1980); cumulative grade point average (Box, 1983; Murray, 1988; Savoie, 1980); creativity (Guglielmino & Guglielmino, 1983; Torrance & Mourad, 1978); curiosity (Barnes, 1999); the number of hours spent in self directed learning (Graeve, 1987; Skaggs, 1981); use of learning contracts (Kasworm, 1982); locus of control (Skaggs, 1981); self concept (Sabbaghian, 1980; Savoie, 1980) and psychological type (Kreber, Cranton & Allen, 2000). O'Kell (1988) observed an inverse relationship between SDLRS scores and successive years of education in nursing school.

The most direct criticism of the SDLRS was presented by Field (1988) and Straka (1996). Field dismissed the reported validity and reliability estimates on the basis of purported lack of convergent validity, the use of the Delphi method, lack of definition of key terms, use of reverse scored items, and the factor analysis process. Rebuttals to these criticisms (Guglielmino, 1989; Long, 1989; McCune, 1989) have cited Field's selective and inadequate literature review, misrepresentation of his own and others' findings, use of a modified version of the scale and different sample, and confusion over appropriate factor analysis methods as the major reasons why his findings and conclusions were faulty. Straka (1996) concluded that the factor analysis solutions proposed by Guglielmino were not stable. Rebuttals to his criticism (Guglielmino, 1997)

have cited Straka's use of a 41 item version of the instrument that has never been the subject of research, his faulty assumption that items should load on only one factor and should be identified as relating to only one characteristic or skill and his use of experts who were students and who had taken one course in andragogy from Straka himself as major reasons why his findings might be faulty.

Completion Questionnaire: Parts 2 and 3

Both student and faculty year one completion questionnaires provided respondents with an operational definition of self directed learning (Cooper, 1980) to ensure a common frame of reference for responding to the items related to SDL. Parts 2 and 3 of the completion questionnaire were developed by the researcher for the purposes of the study and were pilot tested with a small group of seven students who had progressed to the fourth year of the program. Some of the items were developed for this study while others were derived from the literature and from studies on related topics. (Alspach, 1991; Cooper, 1980). Part 2 of the student questionnaire was used to solicit information related to instruction in and experiences with SDL prior to the baccalaureate program and opportunities provided for learner control during the program. Part 3 of the student questionnaire focused on learner responsibility in following through with opportunities provided.

Part 2 of the faculty completion questionnaire requested information related to faculty preparation in SDL teaching methods and frequency with which faculty provided opportunities for SDL to the baccalaureate students. Part 3 focused on faculty perception of how often students followed up on opportunities provided.

Focus Groups

A focus group interview is a qualitative research technique that capitalizes on interaction within a group to elicit rich experiential data (Ashbury, 1995; Morgan, 1995). A focus group usually consists of six to ten individuals who are similar in some way and who come together to respond to questions of specific interest to a researcher (Ashbury, 1995; Frey & Fontana, 1993; Krueger, 1994). By design, focus groups rely on the dynamic of the group interaction to stimulate thinking and verbal contributions of participants (Krueger, 1994; Morgan, 1993). Spontaneity and clarity of expression of views can be encouraged in a focus group interview to a greater degree than in alternate methods of data collection (Sim, 1998). The advantage of focus groups is that the exchanges among participants helps individuals to clarify for themselves what their behavior depends on. The researcher can gain insight into both the range of opinion and the set of circumstances that will precipitate one response or another (Krueger, 1994; Morgan, 1995). Focus groups provide a safe forum for expression as participants generally feel supported and empowered by a sense of group membership and cohesiveness. Krueger (1994) and Morgan (1993) suggest that this is particularly important if there is a gap between professionals (faculty) and their target population (students). Focus groups become a powerful means of exposing professional faculty to the reality of the student.

The focus group interview is coordinated by a moderator who is often assisted by a co-moderator (Sim, 1998). In focus group research, the researcher and moderator are usually the same individual (Kringry, Tiedje, & Friedman, 1990). The successful moderator must be able to project sincerity, have a sense of humor, and most important,

have the discipline to listen without interjecting personal opinion (Krueger, 1994).

Focus group research designs often incorporate different subsets with potentially contrasting views or experiences concerning the issue under investigation. Break characteristics define how the subsets are differentiated (Knodel, 1993). Even when focus groups are held with different subsets, it is important to ensure that all participants share common characteristics. Control characteristics may be uniform characteristics or may specify a common composition for each group (Knodel, 1993)

Carefully structured and sequenced questions based on the purpose of the study are necessary to elicit a wide range of responses. Questions should be based on a review of the literature and consultation with content experts (Kringry et al., 1990). Determination of the number of focus groups to conduct depends on the responses of the participants. When no new responses to the questions are forthcoming, a point of saturation has occurred and further focus groups do not usually need to be conducted (Krueger, 1994; Sim, 1995).

At the end of the first year of the program guided focus group interviews were held with faculty and students. The purpose of the 1 to 1 ½ hour focus group interviews with students and faculty was to complement the quantitative data, creating a fuller and deeper understanding of learner control and responsibility in developing the ability to become self directed in learning. The synergy of the focus group resulted in the revelation of important constructs which might otherwise have been lost in individually generated data. The primary control characteristic for both students and faculty was that all had been engaged in the PBL process over a one year period of time. The primary break characteristic was that students and faculty were interviewed separately. A semi

structured interview guide based on a review of the literature and on consultations with content experts was carefully structured and sequenced (Appendix E). One focus group interview with four faculty participants was conducted with faculty tutors. Although saturation was reached after four focus group interviews, five interviews (including three, five, seven, seven, and eight participants respectively) were held with students at the end of the first year.

Procedures

The dean of the Faculty of Nursing was contacted by the researcher to discuss the study and its proposed procedures. With the dean's approval (Appendix F), the researcher met with the associate dean of the undergraduate program and subsequently, the first year program coordinator. The purpose of these meetings was to describe the study aims and procedures, to gather information about the student schedules, to answer any questions either individual might have, and to solicit suggestions regarding the best times for the student and faculty data collection.

Student Data Collection

The first year program coordinator was asked to provide the researcher with course registration lists and class lists to ensure that each student was contacted. Subsequently the researcher made arrangements with individual faculty to determine the best time and date for data collection on entry to the program and on completion of the first year. All student data collection was planned to coincide with the beginning or end of a previously scheduled tutorial time. Tutors were asked to identify students from their groups whom they felt would be comfortable contributing to a focus group interview. A form of random sampling (Kreuger, 1993) was used to invite two to three students from

each tutorial group to participate in the focus group interviews.

Faculty Data Collection

The researcher introduced the study to faculty at a pre-scheduled tutor meeting (Appendix G). Faculty who wanted to participate were asked to complete the consent and return it separately from the initial questionnaire. At the end of the first year, all faculty received program completion questionnaires but only those faculty who had completed the program entry questionnaire were included in the study. A random selection of those faculty involved in tutoring during both terms of first year were invited to participate in the faculty focus group interview.

Data collection procedure

Information letters and consents (Appendix H) to participate in a research project were distributed to all students two weeks prior to data collection. Students who wished to participate in the study were asked to complete the consent and return it to the researcher's office one week before data collection was scheduled to begin. At the time of initial data collection, additional consents were available for students who wanted to participate but who had not had a chance to return their completed consents to the researcher's office. During data collection the researcher read from a preset script (Appendix I). The researcher provided instructions for completing the questionnaires provided by the researcher on the cover sheet of each questionnaire (Appendices A, B, C, D). Students were asked to complete the questionnaires in the order in which they appeared so that the items on self directed learning in Part 2 did not influence the responses to the SDLRS in Part 1. The signed consents to participate were compared against the lists of students to determine response rates. In addition, the researcher

mentioned a special incentive for student participation. A seventy-five dollar University bookstore draw prize was awarded at the completion of data collection to a student who completed both entry and completion questionnaires. Following the introduction, the researcher answered any questions before distribution of the questionnaires. A similar procedure was followed for data collection at the end of the first year in the program.

Since tutors did not meet on a regular basis, information letters, consents to participate in a research project (Appendix J) and the initial questionnaire were distributed to all faculty at a pre-scheduled tutor meeting. Faculty who were interested in participating in the research project were asked to complete both the consent and questionnaire but to return them separately to the researcher's mailbox within the week. Pre- addressed envelopes were provided for this purpose.

Invitations and consents to participate in the focus group interviews were distributed to faculty (Appendix K) and students (Appendix L) two weeks prior to the actual interviews. Again, both students and faculty were asked to return the completed consent to the researcher's office or mailbox one week prior to the interviews. The researcher, who had considerable experience facilitating groups, acted as moderator for the focus groups. Both students and faculty were asked at the beginning of the interview to complete a focus group agreement for maintaining confidentiality (Appendix M). A preset script was used to introduce the focus group interview and the interview questions did not change from one focus group interview to another. In order to discourage "group think", participants were provided with a preview of the main topic areas and asked to jot down preliminary notes that could guide their contributions. Seeking verification of the key points of the discussion from participants at the end of the focus group interview was

one way of establishing validity of the information (Krueger, 1994). This was accomplished by providing participants with a brief summary of the discussion and requesting confirmation of summary accuracy at the end of each focus group interview.

Focus group field notes including seating diagrams, speaker identification and group dynamics were the primary role of an assistant moderator (Kreuger, 1993; Morgan, 1995) who had experience as a PBL tutor and considerable experience in conducting focus groups. All interviews including the moderator team debriefing were audio-taped. Transcription of the tape recorded interviews was done as soon as possible after each focus group session.

Data Analysis

The biographical data in Part 1 of the research questionnaires were analyzed by computing frequencies, measures of central tendency (mean, median, mode), and measures of dispersion (range, standard deviation, variance).

The SDLRS scores on Part 2 of the entry questionnaires and Part 1 of the completion questionnaires were analyzed by calculation of raw scores, measures of central tendency, and measures of dispersion. Scores for each group (student and faculty) were compared to the national adult norms for this instrument. Paired t-tests were used to compare initial and completion SDLRS scores by student and faculty groups.

The items related to opportunities provided for learner control (Part 2) and learner responsibility (Part 3) of the completion questionnaire were analyzed by means of raw scores, frequencies, and measures of central tendency and variability. T-tests for independent groups were used to compare the student and faculty scores on these items. Multiple regression analysis of student data using SDLRS scores as the criterion variable

included examination of opportunities provided and opportunities followed through as predictor variables. Additional predictor variables such as age, previous experience with SDL, prior instruction in SDL, type of nursing student, and level of academic achievement were also examined. Multiple regression analysis of faculty data using SDLRS scores as the criterion variable included an examination of opportunities offered and student follow through on those opportunities as predictor variables. Additional predictor variables such as age, years of teaching experience, highest educational level, time since completion of last degree, prior instruction in SDL and previous experience with SDL were also examined.

Although the tutor was a tutor in year three at the time of the study, she had no contact with the first year students other than as researcher. Legitimately, the investigator who conducts the focus group interviews also analyzes the data (Krueger, 1993; McDaniel & Bach, 1994). Each transcript is read independently by the investigator and co-moderator who each code the material into distinct segments (themes, patterns and similar words) which are then organized into categories. Investigators subsequently meet to discuss the substance of the words and phrases that are similar and agree on labels for the categories (Morgan, 1993). It is important that the categories are common not only within a single focus group but also across focus groups (Morgan, 1993). Using the co-moderator when collecting and analyzing focus group data substantially facilitates the reliability of the interpretation as the analysis is completed independently and then compared (Knodel, 1990).

Independent review of the transcripts and audio-tapes of the focus group interviews was completed by the moderator and assistant moderator. Content analysis

was used to manually identify salient themes. They then met to discuss the substance of the words and phrases that were similar within and across groups and agreed upon labels for the categories. Initially data were grouped into 10 broad categories that reflected the major domains of the interview questionnaire. These categories were subsequently re-coded to further identify their attributes and detect patterns in the data. Five main themes with actual quotes were generated from this re-coding.

CHAPTER 4

Findings

The purpose of this study was to learn more about the strategies and factors that might facilitate the development of self directed learning readiness in undergraduate baccalaureate nursing students. The objective of the study was to determine the self directed learning readiness of baccalaureate students and their faculty tutors at entry and at the end of one year in a PBL undergraduate nursing program and to identify factors which might influence this readiness. The study instruments used at program entry consisted of two-part questionnaires for both students and faculty: biographical data and Guglielmino's Self Directed Learning Readiness Scale (SDLRS). The study instruments used for data collection at the end of year one in the nursing program consisted of three-part questionnaires for both students and faculty: SDLRS, Self directed learning (SDL) opportunities offered/experienced and SDL opportunities followed through. Part one of the entry questionnaire and parts two and three of the completion questionnaire were designed by the researcher based on the literature and tailored for student and faculty groups. Data were gathered from all students enrolled in and all faculty involved in tutoring in the first year of the undergraduate baccalaureate program at a large Western Canadian university which has been publicly advertised as an undergraduate program that utilizes PBL (context based learning) as the primary method of instruction. In addition, focus group interviews were conducted with both students and faculty at the end of one year in the PBL program.

Students

There were a total of 148 students enrolled in the first year of the undergraduate baccalaureate program. Of that number, 143 completed the entry questionnaire for a 97% response rate. Four students were ill the day the questionnaire was distributed and one declined to complete the entry questionnaire. By the end of one year, six students had withdrawn from the program and two students were ill the day the final questionnaire was distributed providing a 91% response rate. Although 140 students completed the end of year one questionnaire, only 135 had also completed the program entry questionnaire and thus were eligible for inclusion in the study.

There were 126 female and 9 male students in the study. The student sample ranged in age from 17 to 42 (Table 1) with a mean age of 19.8 (SD=3.34). Three types of students based on level of academic achievement were represented in the sample: students with a high school diploma as their highest level of achievement, students with some college or university courses, and students who had completed a diploma/certificate or baccalaureate degree (Table 1). The four students who held a certificate did not specify the nature of the certificate. Among those students who had completed a baccalaureate degree (n=16), nine (56%) had a Bachelor of Science (including Pharmacology, Agriculture, Biology, and Psychology), four (25%) had a Bachelor of Arts (including Sociology, History/English, Anthropology and Geography) and three (19%) were unspecified.

Table 1

Student Characteristics

Characteristic	Dimension	Frequency (n=135)	Percent
Gender	Female	126	93.3
	Male	9	6.7
Age in years	17-18	67	49.6
	19-22	45	33.3
	23-42	23	17.0
Highest academic achievement	High school	76	56.2
	Some college/ university	39	28.9
	Diploma/certificate	4	3.0
	Baccalaureate degree	16	11.9

Faculty

There were a total of ten faculty involved in tutoring the first year students for both terms of the first year of the undergraduate baccalaureate nursing program. Of that number, eight completed both the program entry and year one completion questionnaires for an 80% response rate. Although analyses were conducted on the faculty sample, they must be interpreted with caution due to the small number of faculty involved.

The entirely female faculty sample ranged in age from 40 to 55 years (Table 2) with a mean age of 49.88 (SD=4.19). Fifty percent (n=4) of the faculty held a master's degree as their highest educational level of academic achievement, 37.5% (n=3) possessed a doctoral degree and 12.5% (n=1) held a baccalaureate as their highest level of academic achievement. Of those faculty who indicated a masters degree as their highest level of achievement, 25% possessed a masters in nursing and of those who indicated a doctoral degree as their highest level of education, 25% possessed a doctoral degree in nursing (Table 2). Those who did not have a nursing degree had masters and doctoral degrees in Education. Amount of teaching experience was also assessed in this study (Table 2). Equal numbers of faculty (37.5%) had either one to five years of teaching experience or 20 to 25 years of teaching experience with a mean of 13.63 years (SD=9.56).

Table 2

Faculty Characteristics

Characteristic	Dimension	Frequency (n=8)	Percent
Gender	Female	8	100
	Male	0	0
Age in years	40-50	4	50
	51-55	4	50
Highest academic achievement in nursing	Baccalaureate	4	50
	Masters	2	25
	Doctorate	2	25
Highest academic achievement outside nursing	Baccalaureate	1	12.5
	Masters	4	50.0
	Doctorate	1	12.5
	Not applicable	2	25.0
Teaching experience in years	1-5	3	37.5
	6-10	0	0
	11-15	1	12.5
	16-20	1	12.5
	21-25	3	37.5

Major research questions

Eight major research questions were addressed in the study. Additional research questions were considered to examine the possible relationships between self directed learning readiness and variables that were identified from the literature as being related to SDLRS. Focus group interviews exploring the relationship of learner control and responsibility to the ability to become self directed in learning were conducted with students and faculty.

SDLRS at program entry (Questions 1 and 2)

SDLRS scores can vary from a low of 58 to a high of 290. The average score for adults completing the SDLRS scale is 214 (Guglielmino, 1989). For the entire student sample, SDLRS scores on program entry (pre test scores) ranged from a low score of 160 to a high score of 271. The mean SDLRS was 219.6 with a standard deviation of 21.5 (Table 3), indicating that this group of students was average in self directed learning readiness at the beginning of their undergraduate nursing program. The reliability of the SDLRS at program entry for the student sample as measured by the Pearson split half reliability estimate and Cronbach alpha reliability coefficient was .91 and .92 respectively.

A multiple regression analysis was performed with SDLRS scores serving as the criterion variable. Age, gender, level of academic achievement, completion of courses designed to teach self control over learning, previous involvement with PBL, participation in SDL projects, source of SDL experience, instruction in SDL and source of this instruction were examined as possible predictor variables. The results of the

Table 3

Student Pre and Post Test SDLRS Scores

	Students n=135			
	Mean	SD	Min	Max
SDLRS Pre Test	219.6	21.5	160	271
SDLRS Post Test	220.1	21.9	171	275
Difference	.49			

SDLRS Interpretation

<176	low
177-201	below average
202-226	average
227-251	above average
252-290	high

multiple regression analysis indicated that learning/instruction from parents correlated positively (r=.262) with SDLRS, was the best predictor of student pre test SDLRS scores (r=.26, p<.01). and accounted for 6.8% of the variance in the student SDLRS pre test scores (Table 4). Learning from parents correlated positively with having experienced SDL instruction in elementary school (r=.45), high school (r=.50), job activity (r=.33), and with peers (r=.49). Those students with higher SDLRS scores indicated that although they had previously received instruction in SDL from their elementary school, high school, job activity and peers, instruction from parents was a stronger influence. Age, gender, level of academic achievement, completion of courses designed to teach self control over learning, previous involvement in PBL and participation in SDL projects were not significant in predicting student SDLRS pre test scores at the point of entry into the undergraduate baccalaureate nursing program.

For the faculty sample, SDLRS scores on program entry ranged from a low of 218 to a high of 265. The mean SDLRS for faculty was 244.9 with a standard deviation of 16.3 (Table 5), an indication that this faculty was above average in self directed learning readiness. The reliability of the SDLRS at program entry for the faculty sample as measured by the Pearson split half reliability estimate and Cronbach alpha reliability coefficient was .94 and .89 respectively. Multiple regression analysis indicated that age, highest level of education within and outside of nursing, and previous involvement with PBL were not significant in predicting faculty SDLRS pre test scores.

A t-test for independent means was used to compare student and faculty SDLRS scores at program entry. The comparison indicated that students and faculty were

Table 4

Multiple Step-wise Regression Analysis of Student SDLRS Pre Test Scores

Step	Variable	Beta	R	R^2	p
1	SDL from parents	.31	.26	.068	<.01

Table 5
SDLRS Comparison Between Students and Faculty

	Students				Faculty					
	n = 135				n = 8					
	Mean	SD	Min	Max	Mean	SD	Min	Max	t	Significance
SDLRS Pre Test	219.6	21.5	160	271	244.9	16.3	218	265	-4.2	.003**
SDLRS Post Test	220.1	21.9	171	175	245.6	21.1	195	263	-3.3	.011*
Difference	.49				.75					.96

Difference = Pre test score – Post test score
*p<.05
**p<.01
***p<.001

SDLRS Interpretation

<176	low
177-201	below average
202-226	average
227-251	above average
252-290	high

significantly different (t= -4.2, p=.003**). Faculty SDLRS pre test scores were significantly higher than student SDLRS pre test scores at the beginning of the nursing program (Table 5). Although the t-test is considered a robust measure, it is important to note that the faculty sample was very small.

SDLRS at year one completion (Questions 3 and 4)

For the entire student sample, SDLRS scores at year one completion (post test scores) ranged from a low score of 171 to a high score of 275. The mean post test SDLRS was 220.1 with a standard deviation of 21.9 (Table 5), indicating that at the end of one year in a PBL undergraduate baccalaureate nursing program, this group of students remained at an average level in self directed learning readiness. The reliability of the SDLRS at year one completion for the student sample as measured by the Pearson split half reliability estimate and Cronbach alpha reliability coefficient was .92 and .93 respectively.

A one way analysis of variance (ANOVA) and post hoc Scheffe indicated that there were significant differences in student SDLRS post test scores in terms of level of academic achievement. Students with a high school diploma scored significantly lower (F=6.449, p=.002**) than students with some college or university and lower than students with a baccalaureate degree (Table 6). Although there was a decrease in SDLR for high school diploma students from pre to post test, they still maintained an average level of self directed readiness for learning. The minimum SDLRS score for students with some college/university increased from below average to average while the maximum score for these students remained in the high category. A similar pattern was observed for

Table 6
Student SDLRS by Highest Level of Academic Achievement

	Group 1			Group 2			Group 3					
	High School			Some college/university			Baccalaureate					
	n = 76			n =43			n = 16					
	X	SD	Min - Max	X	SD	Min-Max	X	SD	Min-Max	F ratio	Prob	Significantly Different groups
SDLRS Pre	216.8	18.9	171-264	222.6	24.4	160-271	225.2	23.6	183-254	1.611	.204	
SDLRS Post	214.8	21.7	171-261	224.8	19.2	180-275	232.9	23 .0	186-258	6.449	.002**	1<2<3
Difference	-2.0			2.2			7.8			3.455	.034*	1<2<3

SDLRS	Interpretation
<176	low
177-201	below average
202-226	average
227-251	above average
252-290	high

*p<.05
**p<.01
***p<.001

those students with a baccalaureate degree. There was also a significant difference between pre and post test scores for students based on level of academic achievement ($F=3.455$, $p=.034$*). The difference between SDLRS pre and post test scores was less significant for students with a high school diploma than it was for either students with some college/university or students who held a baccalaureate degree.

A multiple regression analysis was performed using SDLRS as the criterion variable and age, gender, level of academic achievement, completion of courses designed to teach control over learning, previous involvement with PBL, participation in SDL projects, source of SDL experience, instruction in SDL and source of this instruction as predictor variables to see if any of these variables were useful in predicting SDLR . The results of the multiple regression analysis (Table 7) indicated that academic achievement correlated positively ($r=.291$), was the best predictor of student post test SDLRS scores ($r=.29$, $p<.01$) and accounted for 8.4% of the variance in student post test SDLRS scores and 5.7% of the difference between student pre and post test SDLRS scores. Learning/instruction from parents also correlated positively ($r=.194$) with SDLRS post test scores, was the second best predictor of student post test SDLRS scores ($r=.19$, $p<.001$), and accounted for an additional 3.8% of the variance in those scores. Together, highest level of academic achievement and learning/instruction from parents accounted for 12.2% of the variance in student post test SDLRS scores. Level of academic achievement correlated positively ($r=.238$) with SDLRS scores, was the best predictor of the difference between student SDLRS pre test and post test scores ($r=.23$, $p<.01$), and accounted for 57% of the variance (Table 8). Students who demonstrated the greatest change in SDLRS scores between pre and post test either had completed some

Table 7

Multiple Step-wise Regression Analysis of Student SDLRS Post Test Scores

Step	Variable	Beta	R	R^2	p
1	Level of Academic achievement	.26	.291	.084	p<.001
2	Learning/Instruction from parents	.19	.349	.122	p<.001

Table 8

Multiple Step-wise Regression Analysis of the Difference Between Student SDLRS Pre and Post Test Scores

Step	Variable	Beta	R	R^2	p
1	Level of Academic Achievement	.23	.23	.057	p<.01

college/university courses or had a baccalaureate degree. Age, gender, completion of courses designed to teach self control over learning, previous involvement in PBL, participation in SDL projects, source of SDL experience, instruction in SDL and source of this instruction were not significant in predicting SDLRS post test scores or difference between pre and post test scores.

For the faculty sample, SDLRS scores at year one completion ranged from a below average score of 195 to a high score of 263 (Table 5). The mean SDLRS for faculty was 245.6 with a standard deviation of 21.1, an indication that this faculty remained above average in self directed learning readiness after one year of tutoring in a PBL undergraduate baccalaureate nursing program. The reliability of the SDLRS at year one completion for the faculty sample as measured by the Pearson split half reliability estimate and Cronbach alpha reliability coefficient was .92 and .93 respectively. Multiple regression analysis with the difference between pre and post test SDLRS scores as the criterion variable indicated that amount of teaching experience was negatively correlated ($r = -.787$) with the difference between faculty pre and post SDLRS scores, was the best predictor of the difference between faculty pre and post test scores ($r=.78$, $p<.05$) and accounted for 61.95% of the variance (Table 9). Faculty with less teaching experience demonstrated a greater difference between pre and post test SDLRS scores. Age, highest level of education in nursing, highest level of education outside of nursing and previous involvement with PBL were not significant in predicting faculty post test SDLRS scores or differences between pre and post test SDLRS scores.

Table 9

Multiple Step-wise Regression Analysis of the Difference Between Faculty SDLRS Pre and Post Test Scores

Step	Variable	Beta	R	R^2	p
1	Amount of Teaching Experience	-.78	.78	.619	$p<.05$

A t-test for independent means (Table 5) used to compare student and faculty SDLRS scores at year one completion indicated that students and faculty remained significantly different (t= -3.3, p=.011*). Faculty continued to display higher levels of self directed learning readiness than students displayed at the end of one year in a PBL undergraduate nursing program. While both student and faculty SDLRS scores did increase from pre to post test, the difference was not significant.

Associations between learner control and SDLRS (Question 5)

Using a five-point scale (1=00%, 2=25%, 3=50%, 4=75% and 5=100%), students were asked to estimate the frequency with which they were provided with opportunities for self directed learning (SDL) in their current undergraduate baccalaureate nursing program (Table 10). The SDL opportunities for learning were derived from Cooper's (1980) definition of self directed learning and included the following: identification of learning needs, topic of learning activity, purpose of learning activity, objectives or expected outcomes, appropriate learning experiences, evidence that objectives were achieved, environment, learning resources, time, pace, methods of evaluation and overall opportunity to control learning. The reliability of the "opportunities provided" portion of the questionnaire for the student sample as measured using Cronbach-alpha reliability coefficient and Pearson split-half reliability estimate was .76 and .84 respectively.

Students reported on average that they were provided with opportunities to determine criteria to be used for evaluating less than 25% of the time. They indicated that they had opportunities to decide the pace of their learning, where and when it would occur and how they would be evaluated between 25-50% of the time. Between 50-75% of

Table 10
Comparison of Student and Faculty Estimation of SDL Opportunities

SDL Opportunity	Student Estimate		Faculty Estimate		t	Significance
	n = 135		n = 8			
	X	SD	X	SD		
1. WHAT you needed to learn	3.56	.96	3.75	.46	-1.060	.312
2. TOPIC of your learning	3.24	1.10	3.50	.76	-.927	.378
3. PURPOSE of your learning	3.04	1.14	3.25	.89	-.648	.534
4. OBJECTIVES of learning	3.36	1.03	3.63	.92	-.803	.445
5. Most relevant LEARNING ACTIVITY	4.15	.90	4.38	.74	-.827	.431
6. Selection of RESOURCES	4.52	.68	4.38	.74	.533	.609
7. WHERE learning takes place	2.61	1.19	3.75	1.04	-.300	.017*
8. WHEN learning takes place	2.74	1.11	2.63	.92	.343	.740
9. PACE of learning	2.73	1.04	3.00	1.20	-.617	.555
10. HOW learning is evaluated	2.15	1.28	2.13	1.13	-1.380	.205
11. CRITERIA for evaluation	1.56	.89	2.13	1.13	-1.380	.205
12. OVERALL CONTROL over variables	3.06	.80	2.75	1.04	.910	.391

Scale Interpretation						*p<.05
Number	1	2	3	4	5	**p<.01
Percent	00%	25%	50%	75%	100%	***p<.001

the time, students reported that they were offered opportunities to decide on what they needed to learn, topics of their learning, purpose and objectives of their learning. Students indicated that between 75-100% of the time they were provided opportunities to select learning activities and resources that would help them meet their learning objectives. Students reported that overall they had been given the opportunity to control the majority of the 11 variables involved in their learning between 50-75% of the time

Using the same five-point scale, faculty tutors were asked to estimate the frequency with which they provided their students with various opportunities for SDL. The variables used for faculty were the same as those used for students. With one exception, faculty and students agreed on the provision of opportunities for SDL (Table 10). The reliability of the "opportunities provided" portion of the questionnaire for the faculty tutor sample as measured using Cronbach-alpha reliability coefficient and Pearson split-half reliability estimate was .83 and .91 respectively.

While students indicated that they had been provided with opportunities to determine criteria to be used in evaluation less than 25% of the time, faculty reported providing those opportunities between 25-50% of the time. Students identified that opportunities to decide the pace of their learning and where it would occur were provided between 25-50% of the time whereas faculty indicated that they had provided those opportunities between 50-75% of the time. Students indicated that overall, they had been provided with opportunities to control the majority of variables involved in their learning between 50-75% of the time while faculty reported providing opportunities for overall control 25-50% of the time (Table 10).

Faculty reported providing opportunities for SDL more often than students indicated that they had been provided for the following variables: identification of learning needs, topic, purpose and objectives of the learning activity, selection of learning activities, pace of learning, where learning takes place and determining criteria for evaluation (Table 10). With the exception of deciding where learning would occur (t=-3.00, p=.017*) these differences were not significant. Faculty indicated that they provided opportunities for SDL less frequently than students reported that they had been provided them for the following variables: determining when learning would occur, how it would be evaluated and overall control of variables involved in learning. Again, these differences were not significant.

Associations between learner responsibility and SDLRS (Question 6)

Again, using a five point scale (1=00%, 2=25%, 3=50%, 4=75% and 5=100%), students were asked to estimate the frequency with which they followed through on opportunities provided for self directed learning (SDL) in their current undergraduate baccalaureate nursing program (Table 11). As previously indicated, the SDL opportunities for learning were derived from Cooper's (1980) definition of self-directed learning. The reliability of the "follow through on opportunities provided" portion of the questionnaire for the student sample as measured using Cronbach-alpha reliability coefficient and Pearson split-half reliability estimate was .84 and .90 respectively .

Students reported that they followed through on opportunities provided to identify where their learning would occur, how their learning would be evaluated and the criteria to be used in evaluating their learning between 25-50% of the time (Table 11).

Table 11
Comparison of Student and Faculty Estimation of SDL Follow Through

SDL Follow Through	Student Estimate		Faculty Estimate		t	Significance
	n = 135		n = 8			
	X	SD	X	SD		
1. WHAT you needed to learn	3.73	.85	3.88	.64	-.595	.567
2. TOPIC of your learning	3.64	1.00	3.63	1.19	.028	.978
3. PURPOSE of your learning	3.28	.99	2.88	.83	1.324	.221
4. OBJECTIVES of learning	3.46	.98	3.13	1.36	.687	.513
5. Most relevant LEARNING ACTIVITY	4.10	.93	4.13	1.36	-.059	.954
6. Selection of RESOURCES	4.45	.74	4.13	1.13	.811	.443
7. WHERE learning takes place	2.96	1.16	2.63	1.41	.666	.525
8. WHEN learning takes place	3.13	1.08	2.63	1.30	1.082	.312
9. PACE of learning	3.20	1.04	3.13	1.46	.143	.890
10. HOW learning is evaluated	2.56	1.28	2.25	1.04	.800	.446
11. CRITERIA for evaluation	2.38	1.32	2.00	1.20	.864	.413
12. OVERALL FOLLOW THROUGH	3.39	.84	2.75	1.28	1.400	.202

Scale Interpretation

Number	1	2	3	4	5
Percent	00%	25%	50%	75%	100%

They indicated that they had followed through on opportunities to decide what they needed to learn, topics of their learning, purpose and objectives of their learning, pace of their learning and when it would occur between 50-75% of the time. Between 75-100% of the time students reported that they followed through on opportunities to select learning activities and resources that would help them meet their learning objectives. Students reported that overall, they followed through on opportunities to control the majority of the 11 variables involved in their learning between 50-75% of the time. Using the same five-point scale, faculty was asked to estimate the frequency with which students followed through on opportunities provided for SDL. The variables used for faculty were the same as those used for students. The reliability of the "follow through on opportunities provided" portion of the questionnaire for the faculty sample as measured using Cronbach-alpha reliability coefficient and Pearson split-half reliability estimate was .85 and .89 respectively.

Faculty tutors and students generally agreed on student follow through on opportunities provided for SDL (Table 11). While students reported following through on opportunities to determine the purpose of their learning and when their learning would take place between 50-75% of the time, faculty indicated that students followed through between 25-50% of the time. Although students indicated that overall they followed through on opportunities to control the majority of variables involved in their learning, between 50-75% of the time, faculty reported that overall students followed through between 25-50% of the time. Faculty estimation of student follow through on opportunities for SDL was slightly higher than student estimation for what needed to be learned and selecting relevant learning activities but these differences were not

significant. Faculty estimation of student follow through was slightly lower for all other variables but again, these differences were not significant.

A multiple regression analysis, using post SDLRS scores as the criterion variable and all 12 variables related to follow through on opportunities provided as predictor variables (Table 12), indicated that student follow through on selection of learning activities relevant to their learning correlated positively with faculty SDLRS scores ($r=.911$), was the best predictor of faculty post test SDLRS scores ($r=.91$, $p<.01$) and accounted for 83% of the variance in faculty post test SDLRS scores. The higher the faculty post test SDLRS scores the more likely they perceived that students would follow through on opportunities provided to select learning activities relevant to their learning.

The best predictor of the difference between faculty pre and post test SDLRS scores (Table 13) was faculty provision of opportunities for students to select learning activities ($r=.77$, $p<.05$) and it accounted for 60% of the variance. The second best predictor of the difference between faculty pre and post test SDLRS scores was overall opportunity provided for students to control the majority of variables involved in their learning ($r=.93$, $p<.01$) and it accounted for an additional 27.7% of the variance. Together, opportunities provided for student selection of learning activities relevant to their learning and overall provision of opportunity for student control over the majority of variables involved in their learning accounted for 87.7% of the variance between faculty pre and post test SDLRS scores. Those faculty who demonstrated the greatest difference between SDLRS pre and post test scores were more likely to provide students with an opportunity to select their own learning activities. In addition these faculty were also more likely to provide students with overall control over the majority of variables

Table 12

Multiple Step-wise Regression Analysis of Faculty SDLRS Post Test Scores

Step	Variable	Beta	R	R^2	p
1	Student follow through on selection of learning activities	.91	.91	.831	p<.01

Table 13

Multiple Step-wise Regression Analysis of the Difference Between Faculty SDLRS Pre and Post Test Scores

Step	Variable	Beta	R	R^2	p
1	Faculty provision of opportunities for student selection of learning activities	2.11	.776	.603	p<.05
2.	Overall opportunities for students To control majority of variables	-1.06	.936	.877	p<.01

involved in their learning. For the student sample, there was a significantly positive correlation between opportunities provided by faculty for SDL and student follow through on those opportunities for all of the 12 variables involved in learning (Table 14). For the faculty sample, there was a positive correlation between the opportunities they provided students and student follow through on those opportunities for all variables except deciding the pace at which learning activities would occur. For the faculty, the correlation was significantly positive for the following variables: deciding what to learn, determining the topic of learning, selecting learning activities and resources to meet learning objectives, deciding when learning will occur, determining criteria for evaluation and overall control of the majority of variables involved in learning (Table 14).

Table 14
Correlation Between Estimation of SDL Opportunities Provided and Follow Through on SDL Opportunities Provided for Students and Faculty

SDL Opportunities/ Follow Through	Student Estimate		Faculty Estimate	
	n = 135		n = 8	
	r	Significance	r	Significance
1. WHAT you needed to learn	.358	.000***	.843	.004**
2. TOPIC of your learning	.510	.000***	.875	.002**
3. PURPOSE of your learning	.354	.000***	.821	.072
4. OBJECTIVES of learning	.388	.000***	.681	.354
5. Most relevant LEARNING ACTIVITY	.419	.000***	.796	.010*
6. Selection of RESOURCES	.436	.000***	.789	.010*
7. WHERE learning takes place	.387	.000***	.319	.221
8. WHEN learning takes place	.390	.000***	.823	.006**
9. PACE of learning	.321	.000***	.000	.500
10. HOW learning is evaluated	.314	.000***	.522	.092
11. CRITERIA for evaluation	.322	.000***	.849	.025*
12. OVERALL CONTROL/ FOLLOW THROUGH	.339	.000***	.808	.008**

*p<.05

**p<.01

***p<.001

Experience with learner control and responsibility (Questions 7 and 8)

Five main themes were inductively derived from students' descriptions of their experience: control as mirage, overwhelmed and uncertain, tutor as guide and PBL works and makes sense. Controlling the following learning variables within the structure of PBL: 1) what to learn, 2) how to learn and 3) how to determine if learning has occurred is discussed only under the theme control as mirage. Students described the notion of control over learning variables as a mirage. They indicated that when initially offered the opportunity to control the majority of variables involved in their learning, they felt overwhelmed and uncertain. As the term progressed, students experienced a sense of confidence in themselves and responsibility for colleagues. They identified the quality of tutor guidance as a key factor in how quickly they felt confident in assuming control over their learning. Students clearly indicated that PBL made sense and was working but they also identified some issues with implementation and offered suggestions for dealing with these issues. Similar themes were derived from faculty descriptions of students' experiences in controlling learning variables within the structure of PBL.

Control as Mirage

Students compared their experience of control within the structure of PBL to a mirage. Verbal and written explanations of PBL provided to students suggested that they would control the majority of variables involved in their learning. However, students perceived that they had the opportunity for varying degrees of control over deciding what they needed to learn, how they would learn and how they would know that they had learned.

> "Getting back to the control thing – it's kinda like a mirage sometimes. We have all this control, but really, I don't think we do. We have scenarios – they kind of lay it out and that's what we should be focussing on. But I also think it's kinda like control over the work. I think it's like, this is what you have to know, you are in control over what you want to know about it. So they are telling us what we have to know but not what we have to know about that."

> "I think that we feel that to a degree we have some control over what we are learning. We don't have control when it comes to evaluation".

Faculty concurred that the notion of learner control was somewhat ambiguous. They also indicated that students were offered varying degrees of control over the majority of variables involved in their learning.

> "So on one hand we say to them 'This is PBL and you will learn at your own pace and in your own way.' On the other hand we say 'You will learn this way. You will learn these concepts.' So I don't think they have a vast amount of choice."

Deciding what to learn. Students felt "directed by the learning goals" and "concept maps" that were outlined for each learning package. They acknowledged that the different tutorial groups used the learning goals and concept maps differently. For example, some tutorial groups chose to use the faculty generated learning goals as the basis of their brainstorming while other groups used them as a "check" after they had finished brainstorming relevant learning issues.

Those students who chose to focus on the learning goals prior to brainstorming, justified their use based on arguments of efficiency.

> "So basically, you just cut down to what's on the learning goals and that way you're covered for the exams."

Students who chose to refer to the learning goals and concept maps following their brainstorming session indicated that they felt like they were "cheating" if they used them as a basis for their brainstorming. They also suggested that focusing on the learning goals

"limited creativity" because "once the learning goals were shouted out, everyone stops" offering any other suggestions as possible learning issues. These same students indicated that brainstorming sessions without a focus on learning goals were valuable because colleagues "bring in past experiences" and concepts are discussed that "aren't in the learning goals but could be on an exam". Although students acknowledged that the learning goals were the "minimum" for what they should know for professional practice, they perceived that the content related to the learning goals was "what was on the test" and "you must do well on the test – that's what really counts". They expressed reluctance to allocate time to the exploration of content beyond what was identified in the learning goals.

> "It's more important to us to get a really good mark than it is to be really well-educated even though it might benefit us when we are out in the community or out on the wards in the hospital".

Faculty reflected that different tutorial groups did indeed approach brainstorming differently. They felt that students who checked the learning goals/concepts before brainstorming, brainstormed within "very rigid constraints." Those students who used the learning goals/concepts as a check following brainstorming achieved a greater "breadth of learning". Generally, faculty described students as "truly eager to learn" and willing to "go beyond those concepts" particularly if they understood that the scenario was "one way of stimulating thought" and not intended to "teach them all of the content". However, faculty also commented on the effect of exams on learning. While they acknowledged that professional faculty have a responsibility to assess students during their educational programs, they also indicated that exams stifled student choice about what to learn.

> "As soon as you start looking at assessing, you have a greater potential to start constraining choice in what's covered. In assessing, you are putting an external definition on what is going to be valued and what isn't. Every assessment vehicle or evaluation tool we use limits the choice that they [students] have to some extent".

Decisions about what topics students would pursue on an individual basis following the brainstorming session were handled by tutorial groups in a variety of ways. In some groups, students decided to choose topics that they either knew something about or wanted to learn more about.

> "Sometimes you pick a topic that you know a lot about because you want to share your information. And sometimes you choose a topic that you don't know a lot about".

> "Getting a topic you don't know about makes you seek out different resources. I think it is almost a good thing sometimes. You are not always going to get somebody or something that you are interested in".

> "It has happened to me both ways – I talk about things I know a lot about and I've also backed off on stuff I know a lot about because I know it and they [other students] should learn it".

In other groups students decided to arbitrarily assign topics using one of a variety of methods agreed on by the tutorial group such as assigning numbers to topics and having students draw numbers from a hat. Faculty added that students often chose topics based on "how much time they felt they could spend on it" and whether or not it was either a "favorite interest" or a topic to be avoided.

Deciding how to learn. Students perceived the greatest amount of control over how they chose to learn information related to the topic that they had chosen or been assigned. They indicated that they chose to use their textbooks as their primary resource in first term because it was the "common resource" for exam content even though it

might not be "up to date". By second term, students were expanding their repertoire of learning strategies.

> "There was so much stuff that wasn't in our textbooks that I had to go to the library to research everything. So I'm getting used to technology".
>
> "I really focus on databases. But I shy away from websites – I worry about reliability".
>
> "I have used the library for books and journals more than ever before and more than I have with other degrees".

Students also visited various community agencies and organizations. They interviewed practicing professionals in a variety of practice settings. However, responses from agencies, organizations and practice professionals sometimes acted as a deterrent to further attempts to use these sources for information.

> "PBL really overloads the agencies. They were starting to get annoyed because a lot of people were calling them".

Students commented that they felt some obligation to give something back to the agency or organization for the time and information that personnel were willing to share.

> "I don't really have anything to offer them [agencies/organizations] – I don't have anything to give back to them. So going in and asking for this information – that's really hard to do".

Lack of time was discussed as a major factor that influenced the types of strategies students chose to help them learn. It was identified as an issue because of the demands placed on them from the four support courses they were studying concurrently with their nursing course. Lack of time was also an issue for tutorial groups if tutorials occurred on consecutive days of the week. It influenced the type of resources students chose to use to investigate their chosen/assigned topic.

> "I think time has a lot to do with the strategies you are going to use".

> "I think that as much as there are all those different resources, I would like to use them but you don't have time to use them".
>
> "Everybody uses the same resources – library or textbooks basically. Nobody had time to go further than that".

Students recognized the "importance of learning about different teaching strategies" but lack of time also influenced how creative they felt they could be when they shared their information with their colleagues.

> "And how you present – if you had more time you could be more creative. I don't need people reading to me. Sometimes I felt I wanted to bring in a big poster but then I would think, I don't have time for that".

Asking each other questions, sharing experiences with each other and discussion during tutorial were other strategies students identified as helping to facilitate their learning.

> "In my group we are starting to question each other. When we question each other, we help each other out in the group. We question our own work and that helps us understand it a lot better".
>
> "We all have questions. I've learned that if you don't ask questions, you will lose out in the end".
>
> "We talk about our personal experiences, like if you know someone who has asthma, you talk about what you know. Then other group members remember it. You remember "Oh Bert told me that----".
>
> "Talking about it as a group and getting everybody's view instead of just having your tutor tell you will help us with learning and nursing".

Faculty members commented that students were "very aware of time constraints." Those faculty who had been tutors in PBL from the time of its inception reflected that current students "primarily use their textbooks" and there was much "less variety in the resources" that students used to explore specific topics. They indicated that there was

often a distinct pattern of resource utilization within their tutorial groups. The "same students are the ones who access articles from the library and everyone else depends on them."

Faculty reported that current PBL students were generally "less creative in how they chose to share information with colleagues" than previous PBL students. However, they all indicated that they had one or two students in their tutorial groups who were "amazingly" creative. Faculty attributed the decreased variety in resource utilization and decreased evidence of creativity in sharing information to be partly due to the to fact that "previous students had had one quarter less time in face to face contact with support course disciplines." They also suggested that the current evaluation strategies influenced student choice of resources and strategies for sharing information.

> "I don't think their use of resources, or lack of use, is connected as much to lack of time as it is to having their fingers burnt. Because the content that they were tested on did not reflect the material that they went out and got interview information about. The content that was tested was from their textbook".

Deciding how they know they have learned. Students were able to reflect on a number of criteria that they used to evaluate how effective their learning had been. When they were able to confidently summarize and share their information with colleagues in tutorial and answer questions posed by their colleagues and tutor they felt that they were learning effectively.

> "I am comfortable sharing my information if I know my stuff. Okay, here are my pointers but I would like to expand a bit in the pointers, besides what is written down. And then in that way, I am comfortable knowing that I have learned what I needed to learn".

> "I find the question time after presentations – when other students will say "I'm not sure ----- What do you mean by that?" If you are able to tell them this, not like going back and rereading what you wrote, then you know".

> "And if the tutor asks you something that wasn't in your presentation and you can answer it then you know".
>
> "Or even being able to say "Well that's a very good question" and think about it for a while. You sorta think about it in your head and try to reason as to what the answer might be. And if you are good enough – if you know your stuff enough to be able to think like that, to not just regurgitate but manipulate that information in your head".

Being able to respond to questions posed by family and friends and consciously applying theory to their every day lives were other indications that students were learning.

> "Another way, I find is if my Mom or somebody asks me about something that I learned in tutorial – and I don't have to run to my textbooks to read it again – if I can just sit there and tell her about it, then I know I know my stuff. I'm able to apply it".
>
> "You recognize things going on - say with your neighbor. My neighbor is so old and mean. He's not bitter – he's at stagnation vs isolation. So being able to apply it to every day life and knowing why".
>
> "Even when you are eating your lunch. Okay, I'm having my iron and my folic acid now".
>
> "It comes out in the way I relate to people. The way I think and the way I deal with people is completely different now. For example, I am a floor coordinator in residence ---. I think about long term. "Is this person going to come back to see me? Do I need to give him all the information now?" I deal with those situations through nursing. Not through whatever skills I had before I entered the program. It is definitely different now".

Students acknowledge that they are learning a great deal but report that what they learn is not necessarily being tested. They argue that they are able to decide to some extent what they are going to learn but they have no input into how they will be evaluated on that learning. Consequently, their exam marks may not reflect the relevance of the learning that has occurred.

> "I think that I have learned a lot but it is not being tested. So I'm getting a mark that says that I haven't learned because I haven't learned the stuff I'm supposed to

> learn. For example, they say "What are the seven things you should do when listening?" Well you might be a very good listener, but you don't remember the exact list".

Students also expressed a desire to receive a mark for their tutorial performance. They acknowledged that a lot of valuable learning occurred in tutorial sessions that couldn't be tested and that it was devalued by not receiving a grade for PBL performance.

> "I think we should be graded on them [tutorials] – as a means of evaluating how we think critically".

> "You are dealing with a confidence level in yourself and the self esteem level in yourself and it is growing because you are sharing in front of people and you are pretty sure about the information – that kind of stuff isn't testable."

> "You really can't test how I've grown personally and how you grow personally is I think the way you will become a good nurse".

Not receiving a mark for tutorial performance also influenced the quality of student participation in tutorial sessions. Students indicated that "there was less pressure" to use a variety of resources for investigating their chosen/assigned topics, to use creative strategies to share their information with colleagues and to consistently participate in tutorial discussions. If they were to receive a mark, they suggested that they would likely focus more on the quality of their tutorial participation.

> "If you know that 25% or whatever of your mark is going to come from participating in the group, you are going to say "Well, I'm going to have to say something – I'm going to have to think about that".

> "I would put in more effort – getting different resources. And being creative – it would be more interesting".

> "You could even have a requirement that you have different types of presenting".

Faculty emphasized that "true PBL marks them on their participation – what they have to offer to the discussions and their critical thinking in those discussions".

Overwhelmed and Uncertain

As students made the transition from traditional high school or university programs to the current PBL program , they experienced a variety of feelings and emotions. They most frequently described themselves as initially overwhelmed.

> "It was too overwhelming at the beginning. I had never been involved in PBL type learning. I was kinda lost, but you do eventually learn it".
>
> "It's just overwhelming. It's a different kind of learning. It's hard to pick up".
>
> "I found that first term so out of control because we did not know what was going on".

Students experienced repeated feelings of "uncertainty" associated with their experience in controlling variables involved in their learning. They expressed uncertainty about the program, about how well prepared they would be for their exams during the program, and about how well prepared they would be for professional practice when they graduated.

> "In the first term none of us knew what to expect. The tension was palpable in that room".
>
> "It was so new to us, it was kinda like working without a safety net".
>
> "The feeling of comfort wasn't there and we spent a lot of time wondering if we were doing the right thing which was kinda counterproductive".
>
> "It's kind of unnerving to walk into an exam. I feel better about it this term than I did last term. This time I have a better idea of what I have to study".
>
> "I just don't know if what I'm gaining is the right stuff that I have to gain to be a good nurse".
>
> "One of the biggest unsettling things in PBL is that nobody has graduated yet – nobody has written their RN exams – nobody has been out there yet so there is no feedback on how it's turned out".

In an attempt to deal with their feelings of uncertainty related to the program, students would rationalize that "back east where the PBL has been set up for a few years, it's working great". Students solicited the opinion of students who had progressed to year two of the program. They also sought confirmation of the value of the program from practicing professionals within and outside of nursing.

> "I have talked to the second years and it's going to come together when we get into second year".
>
> "I asked a few people. I have asked post RNs and medical doctors what they think of PBL and they say once they get everything fine tuned it will be okay. Just to hear them say that, I was thinking "Oh good, I'm glad".

Students also conveyed uncertainty about whether their learning reflected an appropriate level of breadth and depth. They expressed uncertainty about the relevancy of some of the information they were sharing with colleagues.

> "It was such a huge topic, I didn't know how deep to go".
>
> "It's really hard to know what exactly we need to know and how much".
>
> "How much of this is relevant?"

Students suggested that a more relevant orientation to PBL may have moderated their feelings of being overwhelmed and uncertain. They indicated that a demonstration tutorial with students from years two to four during orientation week followed by tutor modeling during the first scenario would have been beneficial.

> "The program is working fine. You need to give us a bit more grounding before we get tossed in there. Having a better orientation".
>
> "There just should have been a little more structure at first – more guidance from the tutor".
>
> "If the tutor gave structure to the first scenario – you could observe and learn from that".

> "I've been given good guidance right from the start. I think that helps. I didn't feel this overwhelming sense of panic compared to some groups".

Faculty observed that students "are so anxious when they come into it [PBL] that they are desperately looking for structure". Faculty members additionally commented on their own uncertainty and in some cases wondered if they were better tutors when they were not so familiar with the process of PBL.

> "What's this group going to be like? I had good groups the last time. Is this going to be the group that I don't want to have? But it hasn't happened yet."

> "Not knowing how it is going to unfold. When I meet a new group I'm always anxious"

> "I find too, if there are certain topics that I'm not comfortable with, that I feel anxious. It indicates that I need to do more research. So I can share where they are at. I think that's the feeling I have when I'm not certain whether they are in the right spot compared to material I feel comfortable with."

> "I was probably a better tutor then – in my insecurity. I really did explore with the students. And I think those students had more opportunity to examine whatever they wanted. We really were more of a group looking at this. As time went along we had exams and I began to realize that my students were going to fail if they didn't know these concepts. So, that's when I started to guide them. I have probably limited their choice by doing that."

Tutor as Guide

Students were able to clearly articulate their understanding of the tutor as a facilitator of learning. They acknowledged that the role of tutor was not to provide them with content but they did depend on the tutor to guide them in the "right direction". "Knowing you are on track – the stress level just fades away". They indicated that tutors needed to be "confident" as tutors, "credible" as professional nurses and "consistent" in their behaviors.

"If you have one person who can see and knows where they are going, you know you will get there okay. You will stumble a few times but you will get there okay".

"Some of the tutors don't know what is going on ----".

"Some tutors haven't done a certain kind of nursing for years. They say "Well, I don't know. I haven't done that in so many years I forget."

"The inconsistency between tutors – how they see, how they evaluate, how they use PBL".

"One tutor won't help you out one bit and another tutor will help you out so much. There has got to be more consistency there. If you're going to have a program like this run efficiently, the tutors need to be on the same page".

According to students, tutors were able to facilitate student learning by "guiding rather than directing", providing feedback, ensuring information relevancy and role modeling professional behaviors related to communication and leadership in particular.

"You don't feel in control of your learning if you are not getting some kind of guidance. You need feedback".

"If there is no guidance, you don't have control, even though you are in control of your learning, you are totally out of control".

"There's cues in terms of what you may not have covered and what you need to cover or what you don't know".

"The tutor had a really good handle on what was going on. They could ask questions that would get you thinking or just leading you onto things without coming out and saying "You need to know this" and that makes a big difference".

"One of the reasons that we are in tutorial group is that we have five or six people to be able to use communication skills with and gain leadership qualities. And having a tutor who can really model those skills for you and explain why they are saying what they are saying – that's the best way to learn that stuff. You know, we have to look at it in context".

Certain tutor behaviors were identified as detracting from student learning. Directing rather than guiding and observing without providing feedback were considered non-facilitative tutor behaviors.

> "If she says "Well you need to know this", it's frustrating cause it's too specific".
>
> "Then it doesn't help – your tutor just sits there. Or someone sitting there and listening to us chat and kinda saying "Well you need to be more on track".
>
> "Our tutor doesn't really provide feedback on what we might have missed – it's fend for yourself. That makes me feel less in control of my learning".
>
> "When they [tutors] sit back and don't answer your questions or they don't give you any feedback or they don't share their experience then they are not very useful – they shouldn't even be there".

Tutor reliance on a standard response to student questions and spending an excessive amount of time discussing the tutor's area of specialty were cited as additional behaviors that students did not find effective in helping them learn.

> "Everything we asked – we would get "Oh I can't tell you that. You need to go do that on your own. Every single thing".
>
> "They would just sit back and nod and that was not helpful because they [the student] had no idea what to do and they still don't know because they asked the tutor and the reply was "I can't".
>
> "And not just spending a lot of time on something because that's the tutor's specialty. We run into that a lot".

Students were quite clear that tutors needed to be interactive guides. It was considered facilitative if tutors knew when to answer students' questions directly and when to answer students' questions with a series of guiding questions that would help students answer the question themselves. Coaching, modeling and judiciously sharing from their own experience were behaviors that students identified as being facilitative.

Faculty were able to identify a variety of ways that they felt they facilitated student learning. Acting as a resource, using role play, and guiding through questioning were activities that faculty suggested contributed to student learning.

> "The most important thing we can do is listen and observe".
>
> "I would become the client. You use that kind of role play to trigger an investigation to somewhere they need to be heading and they are not. Or else to get them to review all the things that they have accomplished and to see that they can use it."
>
> "I think we have to question a lot. Thoughtful questions – questions that can stimulate them. The questions have to be based on observing how they are doing and putting that together with where they seem to be going to achieve what they are supposed to achieve. It becomes quite a discernment. It is more tiring than any other sort of teaching. You really have to be alert and thinking."
>
> "You really have to enjoy where they are at --- you kind of watch as to what will help that student in ways --- if you see them struggling, you do things with the group. We have to develop an environment of trust at the beginning. Whatever method they choose, whatever things they come back with, it's okay. I think that the tutor has a responsibility to create that environment and to be available outside tutorial. And help them. I think we have to help them. You have to be a resource."

<u>Confident and Responsible</u>

The tutorial process and skilled tutor involvement in the process were critical in helping students develop a sense of responsibility for and confidence in themselves personally and professionally.

> "What gives me a lot of confidence about actually graduating and getting into the workplace is that I know that this is way more similar to the way that I am going to have to work and the way that I am going to have to learn more information once I'm done".
>
> "If you have a good facilitator, you gain confidence. If they look like they know what they are doing, you feel like you know what's going on".

Students were very conscious of their individual responsibility in facilitating the learning of colleagues. They also discussed their reliance on colleagues to facilitate their own learning.

> "I know my group is relying on me."
>
> "You are relying on those people – to give you the information so you want them to do a good job. That's why you question them – because you want all the information you can get".

Students acknowledge learning a variety of skills and attitudes that are relevant to their practice as professional nurses. They indicated that they are learning how to work collaboratively, value diversity and deal with ambiguity.

> "As a group, we got together and helped each other out. People often bring things in to complement other people's information – which is really good because then you have people who are experts in one little area sorta helping people who don't know as much. That's the really good part – it really brings people closer together".
>
> "I really like tutorial because other people have different opinions and I do learn different ways of thinking".
>
> "Meeting different people, adjusting to their learning, and adjusting to their teaching is sometimes hard."
>
> "The biggest thing I've learned is that there is always people in the group that you don't like but you can still work with them without necessarily liking them".
>
> "I am adapting, which is good and that tells me something too, that I can adapt because everything is not going to be perfect all the time".

Students comment that they are developing a deeper awareness of themselves and others partly through the process of regular self and peer evaluation. They reflect on peer evaluation as sometimes being "uncomfortable".

> "I just think I'm learning to get to know other people and even myself".

> "I know evaluations help me with what we do in class. Because, sometimes you are not meaning to be a certain way and then someone will say something and you can change".

Faculty recognized students' abilities and willingness to share their growing awareness of their own personal and professional growth.

> "She said "I learned something about myself yesterday. I learned that I don't like new things. And I don't like challenges that challenge me publicly. And it made me wonder last night how I would manage in nursing because I will get challenges that challenge me publicly every day. So to you who have been so accepting of this I offer my profound thanks and next time I do it you can lose it with me."

Faculty acknowledged the discomfort that they too experienced when publicly evaluated by students as part of the tutorial process.

> "Students do critique you and it's kinda hard to take. Before, my mind would go blank when that happened. I'm just sort of sitting there saying "Okay, do you want to respond to this? And how are you going to respond to this." Now I'm a bit calmer."

The silent tutorial group member poses a particular challenge for other students as they struggle with their feelings, trying to understand and deal with the individual.

> "Sometimes I feel that the people who aren't contributing readily, aren't contributing their share. That person has a lot of information and good ideas and they are not sharing them with the group. I think if they shared with the group everyone would benefit."

> "Some people are comfortable with the fact that everything has been said and they don't feel they have to say it again. I know it would be great for them to acknowledge that."

> "It's hard for me to believe that somebody can go through six weeks of class and contribute maybe three times."

> "I think it is a benefit to have a silent group member – it makes you think about what you are going to say next and do you really need to say it".

> "You look at people differently now – you think about what their background might be, how they communicate, if they are ready to talk. You just watch more".

Students report that they are learning how to learn and describe this as the most important goal of a university education. They identified an awareness of the need to continue to learn throughout their professional careers.

> "You have to know how to learn because whenever you are in a new situation you're going to have to know how to solve whatever problem it is. You're going to have to know. That's what University is all about – it's about learning how to learn."

> "I'm probably going to have to go to the library and research and find new information for myself as well as colleagues. I know I am on the right track for when I actually finish".

> "We are going to learn so much, in terms of working and being responsible for what we know. I'm sure we are going to be coming home with books all the time. I think the value in it is that you are not only learning about information but how to apply it and you are learning how to interact with people. We will be working with the health care team. Maybe even with people you don't like, of different sexes, people with different views."

PBL Works and Makes Sense

Within the current structure of PBL students identify a variety of factors that diminish the control they felt they could have over their learning. Lack of time, no mark for tutorial participation, no input into exams, and inconsistent tutor guidance were the most frequently identified issues. Students were clearly able to articulate suggestions for dealing with each of the issues. Their strongest plea was for tutors: "Don't tell us, show us, lead us, guide us – don't leave us on our own in the dark bumbling by ourselves. That's no way for us to determine our way of learning".

It is interesting to note that all male students in the focus groups specifically requested more "structure". Several suggested a year of traditional course study "to get the basics" prior to beginning the study of nursing. Others thought that a better orientation to PBL and tutors who were able to act as guides would meet their need for

more "structure." One student indicated that he still preferred "the old way" because he was "used to it and liked it." He also suggested that "girls learn differently from guys."

Despite the fact that students were able to identify issues with the current implementation of PBL, they were vocally enthusiastic about the program.

> "We do like PBL though, don't get us wrong".
>
> "I would rather do this than sit in a lecture theatre ---".
>
> "When you go to other post secondary [institutions], you never get the chance to discuss it with people, unless you do it on your own time. "
>
> "I'm really enjoying it. You go to class and like this is fun, we have a good time".
>
> "I'm having fun learning. I love this program, it's great. I am comfortable in what I know – in that I know it well".
>
> "I think it is an excellent way to learn".

Students reported that the program made sense to them as it reflected accurately how they would need to practice as professional nurses. They felt confident that they were developing the skills they would need for professional practice.

> "I did my first year of nursing at U of ---, which is a traditional program. After being in this program, I do see where they are going and I do think it is better. I just do realize and recognize that there are improvements to be made and as long as we work towards those, I think this is a good program. I definitely feel that I have come out with a lot more this year than last year. I can see a difference".
>
> "It really helps you identify what you are good at and what you need help in. So that's a benefit."
>
> "I like the scenario aspect ---that's how it's going to be. People are going to be coming with their development, their problem, their family. I think that's wonderful. I think it's a good practice tool to have to combine it all together."
>
> "PBL has a ton of potential. It really is an amazing program. I know a lot and I'm gaining a lot through the courses".

"PBL is wonderful because that's how it's going to be in practice. Being able to deal with that before you get out is very valuable".

"The whole purpose of it [PBL] is to get you ready to work as a nurse with other nurses and solve problems that people have - which makes sense."

Sample Characteristics and Relation to Self Directed Learning Readiness

In addition to the research questions considered above, the possible relationship of SDLRS scores to variables identified in previous research as related to self directed learning readiness (age, gender, prior experience with SDL, prior instruction in SDL were examined. The results of this examination follow.

SDLRS and Age

The student sample was grouped according to the following age categories: 17- 18 years, 19-22 years and over 23 years. A one way analysis of variance (ANOVA) indicated that there was no significant difference in student SDLRS pre test scores or difference between pre and post test scores based on age. However an ANOVA did reveal a significant difference in student post test SDLRS scores ($F=5.825$, $p=.004^{**}$) based on age (Table 15). Younger students (17-18 years) scored significantly lower on their post test SDLRS than did their older colleagues (23+ years). Compared to SDLRS post test scores for younger students (17-18 years), SDLRS scores for the older students (23+ years) did not reflect any scores in the low category and more than five times the number of scores in the high category. Although age was negatively correlated with faculty SDLRS pre test, post test and difference between pre and post test scores ($r=-.315$, $-.485$, and $-.393$ respectively), it was not significant in predicting SDLRS pre test, post test or difference between pre and post test scores.

Table 15
Student SDLRS by Age

	Group 1			Group 2			Group 3					
	17 & 18 years			19 – 22 years			23 + years					
	n = 67			n =45			n = 23					
	X	SD	Min- Max	X	SD	Min-Max	X	SD	Min –Max	F ratio	Significance	Significant Difference
SDLRS Pre	216.6	21.2	160-264	220.4	21.5	175-271	226.6	21.0	183-264	2.021	.137	
SDLRS Post	214.3	21.8	171-261	223.2	20.2	186-275	230.7	21.2	191-258	5.825	.004**	1<3
Difference	-2.2			2.8			3.9			2.327	.102	

SDLRS	Interpretation
<176	low
177-202	below average
202-227	average
227-252	above average
252-291	high

*P<.05
**P<.05
***P<.001

SDLRS and Gender

The SDLRS pre test scores for male students ranged from a minimum score of 196 to a maximum score of 243 (Table 16) with representation of below average, average and above average scores. SDLRS post test scores for male students ranged from a minimum of 171 to a maximum of 249 with representation from low, below average, average, and above average scores. There were no high SDLRS scores among male students. The minimum score for male students decreased from pre to post test, the maximum score increased and the overall mean decreased. The SDLRS pre test scores among female students ranged from a minimum score of 160 to a maximum score of 271 (Table 16) with representation of low, below average, average, above average and high scores. SDLRS post test scores among female students ranged from a minimum of 175 to a maximum of 275, again with representation of scores from all five categories. Minimum and Maximum scores for female students both increased from pre to post test. Although post test SDLRS scores for female students were higher, multiple regression analysis indicated that gender was not significantly related to student's SDLRS pre test, post test or difference between pre and post test scores.

Table 16

Student SDLRS by Gender

	Male				Female			
	n = 9				n = 126			
	Mean	SD	Min	Max	Mean	SD	Min	Max
SDLRS Pre Test	222.1	19.08	196	243	219.5	21.68	160	271
SDLRS Post Test	219.1	26.09	171	249	220.2	21.72	175	275
Difference	-3.0				.74			

SDLRS and Prior Instruction in SDL

The student sample was asked if they had received instruction in SDL prior to entering their current baccalaureate nursing program. Forty-one percent (n=55) of the student sample indicated that they had received prior instruction in SDL. Students identified a variety of sources for instruction in SDL (Table 17). The major sources identified were high school (21.5%), university (17.8%), and parents (16.3%). Students were also asked if they had completed courses or workshops that taught them how to take control of their learning. Ten students (7%) reported that they had completed such a course/program. Multiple regression analysis revealed that prior instruction in SDL and completion of courses/programs designed to teach learner control had no significant relationship to students' SDLRS pre test, post test or difference between pre and post test scores.

When faculty tutors were asked if they had ever completed courses, workshops, or programs that taught them how to use self directed learning methods with their students, eight tutors (100%) indicated that they had. Since there was no variation in this variable for the faculty, relationships between this variable and SDLRS pre and post test scores were not determined.

SDLRS and Prior Experience with SDL Projects

The student sample was asked whether they had ever participated in SDL projects prior to entering their current baccalaureate program. A total of 40 students (30%) indicated that they had prior experience with SDL. The sources of the SDL experience were varied (Table 18) . The most frequently cited sources were high school (17.8%) and parents (11.9%). Multiple regression analysis revealed that prior experience with

Table 17

Sources of Instruction in SDL

Source of SDL Instruction	Frequency	Percent
Elementary school	11	8.1
High school	29	21.5
College	4	3.0
University	24	17.8
Prior/current job	10	7.4
Parents	22	16.3
Peers	12	8.9

n=55 (41% of student sample)

Table 18

Sources of Self Directed Learning Experience

Source of SDL Experience	Frequency	Percent
Elementary school	11	8.1
High school	24	17.8
College	4.0	3.0
University	9.0	6.7
Prior/current job	9.0	6.7
Parents	16	11.9
Peers	10	7.4

n=40 (30% of student sample)

SDL projects had no significant relationship to student SDLRS pre test, post test or difference between pre and post test scores.

SDLRS and Prior Experience with PBL

The student sample was asked about previous involvement with PBL. Five students (4%) indicated that they had taken a PBL course within the last one to two years. Multiple regression analysis indicated that previous involvement with PBL had no significant relationship to students' SDLRS pre test, post test or difference between pre and post test scores.

The faculty sample was also asked about previous involvement with PBL. When asked if they had taken a PBL course/program, five faculty tutors (62.5%) indicated that they had completed such a course/program. Of those, three faculty reported PBL course/program completion within the last five years and two faculty within the last 10 years. Although very weakly and negatively correlated (r=-.078) with faculty SDLRS pre test scores, completion of a PBL course/program was positively correlated with both faculty SDLRS post test scores (r=.275) and the difference between faculty pre and post test scores (r=.545). Faculty tutors were also asked if they had previously been involved in teaching in a PBL curriculum. Six faculty tutors (75%) reported that they had been involved in teaching in a PBL curriculum within the last 1-3 years. Although negatively correlated (r=-.203) with faculty SDLRS pre test scores, previous involvement in teaching a PBL course was positively correlated with both faculty SDLRS post test scores (r=.142) and the difference between faculty pre and post test scores (r=.485).

Summary of Joint Predictors of SDLRS

Multiple regression analyses were performed for both the student and faculty samples to determine the relative ability of certain variables to predict SDLRS scores. For both faculty and student groups, the variables included in the regression equation consisted of those previously identified in the literature as related to SDLRS, some variables unique to this study and others related to opportunities provided for self directed learning and responsibility in following through on opportunities provided for self directed learning in the program.

Students

For the student sample, the regression equation using pre and post test SDLRS scores and difference between pre and post test SDLRS scores as the criterion variables included nine variables known to correlate with SDLRS. Those variables included age, gender, type of nursing student based on highest level of academic achievement, prior experience with SDL and prior instruction in SDL, participation in SDL projects, sources of SDL experience, instruction in SDL and source of instruction. The equation included one variable unique to this study, involvement with PBL. In addition, the equation included 11 SDL learning opportunities which might have been experienced in their current baccalaureate program and to what extent students followed through on those learning opportunities.

One variable provided significant prediction of student pre test SDLRS scores (Table 19). SDL learning/instruction from parents was the best predictor ($r=.26$, $p<.01$) and accounted for 6.8% of the variance in student SDLRS scores at the point of program entry. Five variables provided significant prediction of student post test SDLRS scores

(Table 20). Highest level of academic achievement ($r=.29$, $p<.01$) was the best to control the predictor and accounted for 8.4% of the variance in student SDLRS scores at the end of one year in a PBL program. The second best predictor of student SDLRS post test scores ($r=.35$, $p<.001$) was student follow through on opportunities to select resources that they thought might help them meet their learning objectives which accounted for 4.2% of the variance. SDL learning/instruction from parents was the third best predictor ($r=.41$, $p<.001$) of student SDLRS post test scores and accounted for 4.5% of the variance. The fourth best predictor of student post test SDLRS scores ($r=.44$, $p<.001$) was overall opportunity to control the majority of variables involved in their learning which accounted for 2.6% of the variance. Student perception of the opportunity to determine the criteria to be used for evaluation of their learning was the fifth best predictor of student SDLRS post test scores ($r=.48$, $p<.001$) and accounted for 3.5% of the variance. Collectively, these five variables accounted for 23.2% of the variance in student post test SDLRS scores. The only variable to provide significant prediction of the difference between student SDLRS pre and post test scores ($r=.28$, $p<.01$) was level of academic achievement which accounted for 5.7% of the variance in the difference between student pre and post test scores.

Table 19

Multiple Step-wise Regression Analysis of Student SDLRS Pre Test Scores

Step	Variable	Beta	R	R^2	p
1	SDL from parents	.31	.26	.068	<.01

Table 20

Multiple Step-wise Regression Analysis of Student SDLRS Post Test Scores

Step	Variable	Beta	R	R^2	p
1	Highest level of academic achievement	.26	.291	.084	p<.01
2	Follow through on selecting Resources	.22	.355	.126	p<.001
3	SDL from parents	.24	.414	.171	p<.001
4	Overall opportunity to control variables	.21	.443	.197	p<.001
5	Opportunity to determine Criteria for evaluation	-.20	.482	.232	p<.001

Faculty

In the faculty sample the regression equation included three known correlates to SDLRS: age, highest level of academic achievement and prior instruction in SDL. The equation included two variables unique to this study: years of teaching experience and previous involvement in PBL. In addition, the post test equation included the eleven SDL opportunities for SDL that faculty could have provided to students in the undergraduate baccalaureate nursing program and student follow through on those opportunities. There were no significant predictors of faculty SDLRS pre test scores. The best predictor of faculty SDLRS post test scores ($r=.91$, $p<.01$) was student follow through on selecting learning activities and it accounted for 83% of the variance in faculty post test scores. Three variables provided significant prediction of the difference between faculty SDLRS pre and post test scores (Table 21). The best predictor of the difference between faculty SDLRS pre and post test scores ($r=.78$, $p<.05$) was the amount of teaching experience that faculty had and accounted for 61.9% of the difference between faculty pre and post test scores. Opportunities that faculty provided for student selection of learning activities was the second best predictor of the difference between faculty pre and post test scores ($r=.98$, $p<.01$) and accounted for 24.2% of the variance. The third best predictor of the difference between faculty pre and post test scores ($r=.97$, $p<.01$) was student follow through on opportunities to decide what they wanted to learn which accounted for 9.3% of the variance. Collectively, these variables accounted for 95.4% of the variance between faculty SDLRS pre and post test scores.

Table 21

Multiple Step-wise Regression Analysis of Difference Between Faculty SDLRS Pre and Post Test Scores

Step	Variable	Beta	R	R^2	p
1	Teaching experience	-1.12	.787	.619	p<.05
2	Provided opportunity to select Learning Activities	.75	.928	.861	p<.01
3	Student follow through on deciding WHAT to learn	-.52	.977	.954	p<.01

Summary

The purpose of this study was to describe the self directed learning readiness of baccalaureate students and their faculty at the beginning and end of one year in a PBL undergraduate nursing program and to identify factors which might influence this readiness. Factors considered in this study that could be potentially influential included biographical characteristics, the self directed learning readiness of faculty tutors, opportunities for self directed learning provided in the nursing program and follow through on those opportunities provided for self directed learning.

A three part questionnaire was completed by 135 first year nursing students and eight faculty tutors at the point of entry into the first year of the program and at the end of one year in a PBL undergraduate nursing program. Self directed learning readiness was measured using Guglielmino's Self Directed Learning Readiness Scale (SDLRS). Focus group interviews were held with both students and faculty. The results of this study can be summarized in terms of students, faculty and student-faculty features. A synopsis of the study results follows.

First Year Nursing Students

The mean of student SDLRS pre test scores was 219.6 with a standard deviation of 21.5 and a range of 160 to 271. The best predictor of student SDLRS pre test scores was teaching/instruction from parents. The mean of student SDLRS post test scores was 220.1 with a standard deviation of 21.9 and a range of 171 to 275. The best predictors of students' post test scores in order were highest level of academic achievement, students' perceptions of their follow through on opportunities to select resources that they thought might help them meet their learning objectives, SDL teaching/instruction from parents, students' perceptions of the amount of overall control they perceived that they had over specific variables involved in their learning and students' perceptions of the opportunities provided to determine the criteria to be used for evaluating their learning.

Although there was a positive increase in student SDLRS scores from pre to post test it was not significant. The best predictor of the difference between student SDLRS pre and post test scores was the students' level of academic achievement. Approximately 30% of the students reported having experience with self directed learning prior to their nursing program. Most of this experience was obtained from high school. A very small number of students (3.7%) indicated that they had previous experience with PBL. Students indicated that overall, they had the opportunity to control the majority of the variables involved in their learning and followed through on those opportunities between 50 and 75 percent of the time. There was no significant difference between student SDLRS pre and post test scores based on gender, completion of courses designed to teach self control over learning and previous involvement with PBL.

Analysis of the data from student focus group interviews revealed several themes related to student experience in controlling the following variables associated with learning: what to learn, how to learn and how to determine if learning has occurred.

Students described control over learning within the structure of PBL as a mirage. Although verbal and written material about the program suggested that students would control the majority of variables involved in their learning, students indicated that they felt that deciding what to learn was directed significantly by the learning goals, concept maps and exams associated with tutorial courses. Students reported that they felt they had the most control over how to learn. They could choose which resources they would use to explore specific content, the depth of content exploration they would engage in and how they would share their information with colleagues. Although students could identify various ways that demonstrated that they had learned, they felt the least amount of control over evaluation. They suggested that tutorial participation should be marked and that they should have some input into the final course exam.

When initially offered the opportunity to control variables involved in their learning, students felt overwhelmed and uncertain. As students made the transition to PBL from traditional high school or university programs, they frequently described themselves as overwhelmed. They suggested that a more relevant orientation would mitigate this feeling. Students also experienced various sources of uncertainty. They were uncertain about whether their learning reflected an appropriate depth and breadth. Students also expressed uncertainty about how well prepared they would be for both their exams and professional nursing practice.

As the term progressed, they experienced a sense of confidence in themselves and responsibility for themselves and colleagues. The tutor role was considered a key factor in assisting students to move from feeling overwhelmed and uncertain to feeling confident and responsible. According to students, tutors could foster this transition by guiding rather than directing, providing feedback, ensuring information relevancy and modeling professional behaviors related to communication and leadership. Students report that they are learning how to learn. They are also learning self awareness, how to effectively communicate, how to work collaboratively, and how to value diversity and deal with ambiguity.

Students from the focus group interviews clearly indicated that PBL was working and made sense. Generally, students were satisfied with the PBL program. They indicated that PBL allows them more opportunities than traditional programs to control variables involved in their learning. In addition they had developed a sense of responsibility for their own learning. The PBL program reflects the reality of professional practice but there are some issues with implementation of the program. Students clearly articulated suggestions for dealing with each of the perceived issues.

First Year Faculty Tutors

The mean of faculty SDLRS pre test scores was 244.9 with a standard deviation of 16.3 and a range of 218 to 265. There were no significant predictors of faculty SDLRS pre test scores. The mean of faculty SDLRS post test scores was 245.6 with a standard deviation of 21.1 and a range of 195 to 263. The best predictor of faculty's post test scores was faculty estimation of student follow through on selection of learning activities. Although there was an increase between faculty SDLRS pre and post test scores it was not significant. The best predictor of the difference between faculty SDLRS pre and post test scores was the amount of teaching experience that faculty had. Approximately 88% of the faculty reported having experienced a course/workshop that taught them how to use SDL methods with their students. Sixty-two percent of faculty indicated that they had also completed a PBL course/workshop within the last five years and 75% of faculty reported that they had been involved in teaching in a PBL curriculum within the last three years. Faculty estimated that they provided students with opportunities to control the majority of variables involved in their learning and that students followed through on those opportunities between 25 and 50 per cent of the time. There was no significant difference between faculty SDLRS pre and post test scores based on age, highest level of academic achievement within and/or outside nursing, or involvement with PBL.

The themes that were derived from the faculty focus group interview were very similar to those that emerged from the analysis of the student focus group interviews. Since all faculty tutors were experienced in PBL, they were able to compare the current students with previous PBL students. The biggest difference that they noted was that current students were assuming less control over how they chose to learn and share their

information than their previous colleagues. In addition, faculty members were able to identify how their own behavior has changed with successive tutorial experience. In particular, they were able to identify how they have expanded their repertoire of strategies for facilitating student learning within the structure of PBL.

Students and Faculty

As a group, students' SDLRS pre and post test scores were significantly lower than faculty pre and post test scores. In general, faculty estimates of the frequency with which they provided students with opportunities for self directed learning were similar to student estimates of having received these opportunities. In addition, faculty estimates of the frequency with which students followed through on opportunities for self-directed learning were generally similar to student perceptions of the frequency with which they followed through.

Chapter V

Discussion

The purpose of this study was to learn more about the strategies and factors that might facilitate the development of self directed learning readiness in undergraduate baccalaureate nursing students. Data were gathered from 135 students enrolled in and eight faculty involved in tutoring in the first year of the undergraduate baccalaureate nursing program at a large Canadian university which uses PBL as the primary method of instruction. Discussion of the study findings will be the focus of this chapter.

Self Directed Learning Readiness Scores of Students and Faculty

According to the criteria established by Guglielmino (1977/78) for the general population (SDLRS=214), first year students at the beginning of this PBL nursing undergraduate program had an average readiness (SDLRS=219.6) for self directed learning. A unique finding of this study was that the best predictor of this readiness was learning/instruction from parents. It could be that students at the beginning of this PBL program conceptualized SDL as learning that occurred outside of the formal educational setting. It would follow then that parents would be the ones who would have the greatest influence in encouraging SDL in their children. If this is the case, then educators who value SDL and think they are incorporating it into their teaching need to closely examine their current ways of teaching. At the end of one year in a PBL program students continued to display an average readiness (SDLRS=220.1) for SDL. The post test SDLRS of students in the present study was higher than O'Kell (1988) reported for senior British nursing students (SDLRS=148.93) but lower than Crooks (1985) reported for first year Canadian nursing students (SDLRS=222.3); lower than Barnes (1999, 2000)

reported for volunteer combinations of sophomore, junior and senior American nursing students (SDLRS=232.9) and lower than Alspach reported for senior American nursing students (SDLRS=230.1). The best predictor of student self directed learning readiness at the end of the first year was highest level of academic achievement. The students in this study who had achieved a baccalaureate degree in a discipline outside of nursing scored above average (SDLRS= 232.9) in self directed learning readiness. These findings concur with those of Alspach (1991) who reported that students who have a baccalaureate degree in a field other than nursing have higher SDLRS than other types of baccalaureate nursing students. This difference may be related to age since 17 and 18 year old students in this study scored lower than 19 to 22 year old students, lower than students with some college or university and much lower than those who were 23 years and older. This difference could also relate to prior college/university learning experiences, since 21% of students identified college/university as a primary source of SDL instruction.

Faculty displayed an above average readiness for self directed learning (SDLRS=244.9) on the SDLRS pre test and continued to display above average readiness on the post test (SDLRS=245.6). The SDLRS post test findings for these faculty were identical to those reported by Alspach (1991) for the faculty in her study (SDLRS=245.6). The best predictor of the change in pre and post SDLRS for faculty was the number of years of teaching experience. Faculty with less teaching experience demonstrated the greatest difference in SDLRS from the beginning to the end of the first year in a PBL program. These findings concur with those of Wood (1995) who reported increased self direction of beginning nursing faculty who had been involved in taking a PBL course. It could be that faculty with less teaching experience have not had the time

or opportunity to incorporate strategies that facilitate SDL into their repertoire of teaching. In this case, the impact of involvement in PBL would be greater for them as individuals than it would be for more experienced faculty who may have over the years tried various strategies to facilitate SDL.

SDLR and Age

The findings of the current study suggest conflicting support for the contention that SDLRS is associated with age. Age and SDLRS scores were positively correlated for students but negatively correlated for faculty. Alspach (1991) also found a positive correlation between age and SDLRS scores for students but no relationship for faculty. A number of other researchers describe a positive correlation between age and SDLRS among subjects of varying age groups (Barnes, 1999; Graeve, 1987; Leeb, 1983; Long & Agyekum, 1983; Sabbaghian, 1980; Skaggs, 1981) while others, using subjects of widely varying ages, found no relationship between age and SDLRS scores (Box, 1983; Brockett, 1985, Caffarella & Caffarella, 1984; Curry, 1983; Finestone, 1985; O'Kell, 1988). Others found a negative correlation between age and SDLRS scores (Brockett, 1983; Guglielmino, Guglielmino, & Long, 1987; Hassan, 1982; Malin, 1986; Savoie, 1979). It could be that as students age, their SDLR scores change for any one of a variety of reasons. It could also be that as faculty age, they reach a point when their SDLR scores no longer change.

SDLR and Gender

The findings of the current study indicated that male students scored higher on the SDLR pre test than female students but that female students scored higher on the post test than did male students. Post test SDLRS results concurred with those found by other

researchers (Curry, 1983; Sabbaghian, 1980) but differed from studies which found no relationship between SDLRS and gender (Alspach, 1991; Box, 1983; Hall-Johnson, 1986). Russell (1988/89) and Wiley (1983) described an inverse relationship between preference for structure and readiness for self directed learning as measured by the SDLRS. According to these authors students who preferred high structure benefited less from SDL experiences. During the guided focus group interviews with students, all male students specifically requested more structure. Clearly, the male students in this program perceived that the PBL approach lacked structure. It could be that when confronted with this perceived lack of structure, male students responded by becoming less self directed in their learning. These findings are consistent with those of Philbin (1995) who found that men appear to find congruence between traditional education and their learning style while women do not. In a meta-analysis of the literature on learning style and gender, Severiens & Ten Dam (1994) report that men scored higher on scales measuring extrinsic motivation, competitiveness, and dependence. This could explain the lower SDLRS scores for men during this PBL program which stimulates internal motivation to be self directed and emphasizes collaboration and interdependence.

SDLR and Prior Learning Instruction

Prior instruction in SDL was positively correlated to student pre and post SDLRS test results. Although these findings were contrary to the findings of Wiley (1983) and Alspach (1991) who both reported no correlation between prior instruction in SDL and SDLR, they do suggest that acquiring knowledge about the skills associated with SDL enhances readiness for SDL in a PBL learning environment. The primary sources of SDL

instruction identified by students in this study were high school, university and parents and were similar to those of Alspach (1991).

SDLR and Prior Experience with SDL

An intriguing finding of this study was that prior experience with SDL projects was negatively correlated with both faculty and student SDLRS scores. The primary source of SDL experience reported by the students in this study was high school. Although these findings were contrary to the findings of other traditional program researchers (Alspach, 1991; Curry, 1983; Finestone, 1985; Hall –Johnsen, 1986; Hassan, 1982; Skaggs, 1981), they suggest that actual experience in applying skills associated with SDL in high school does not necessarily enhance SDL in a PBL post secondary learning environment. Several authors (Brockett & Heimstra, 1991; Candy, 1991; Knowles, 1975, 1980) suggest that even self directed learners who can and desire to be self directed in learning may on occasion not display or pursue this characteristic. Factors that influence when learners will display self directed learning include familiarity with content, technical skills, sense of personal competence as learners and the context of the learning situation (Candy, 1991). Unfamiliar content and technical skills combined with a non traditional learning environment may explain why there was no significant difference in these students' self directed learning readiness from the beginning to the end of one year in a PBL program.

SDLR and Faculty Experience with PBL

A unique feature of this study was the exploration of the relationship between previous faculty involvement in teaching PBL and their SDLRS scores. For this small number of faculty, previous involvement in PBL was positively correlated with both their

pre and post SDLRS and with the difference between their pre and post test scores. It could be that previous experience with the PBL process enhanced the faculty members' familiarity with the context of PBL, their familiarity with tutoring skills, and their sense of personal competence with those skills and this could explain the difference in their pre and post test SDLRS scores.

Association Between Learner Control in PBL and SDLRS

Although students ranked average in their readiness for self directed learning and faculty ranked above average, the findings of this study support the conclusion that unlike most baccalaureate nursing programs, this PBL program provides significant SDL opportunities for students. Furthermore, faculty's perception of providing these opportunities and students' perceptions of receiving them are more similar than dissimilar.

Faculty's perceptions of providing all 11 SDL opportunities for students correlates positively with students' perceptions of receiving them. Of the 11 possible SDL opportunities, students indicated that the majority of them (six) were provided to them between 50 and 75% of the time and that four were presented between 25 and 50% of the time. Opportunity to control criteria used for evaluation was the only variable that students identified as being within their control less than 25% of the time. Overall, students felt they had been provided with opportunities for control over learning variables about 50% of the time. These findings directly contrast with those of Alspach (1991) who found that students in two traditional undergraduate nursing programs perceived that they had been provided with eight of the same 11 SDL opportunities only 25% of the time and that the remainder of the SDL opportunities were never provided.

In the present study, of the 11 possible SDL opportunities, faculty indicated that they had provided the majority (eight) between 50-75% of the time and that three were provided between 25-50% of the time. Overall, faculty felt that they had provided SDL opportunities slightly less than the 50% of the time that students felt they had received them. In contrast, faculty in Alspach's (1991) study of two traditional nursing programs perceived that they had provided SDL opportunities much more frequently than students perceived receiving them. The students' perception of their opportunity to control the majority of variables in their learning was significant in predicting both their SDLRS pre and post test scores. The findings of this current study support the conclusion that this PBL undergraduate nursing program provides recognizable opportunities for students to control the majority of variables involved in their learning and that overall, students and faculty share a similar perception of the frequency with which those opportunities have been offered.

Association Between Learner Responsibility in PBL and SDLRS

Another unique feature of this study was the exploration of student responsibility in following through on SDL opportunities provided. Of the 11 possible SDL opportunities offered, students perceived that they followed through on eight of the opportunities more than 50% of the time. Of the remaining three SDL opportunities, they reported following through between 25 and 50% of the time with an overall perception of following through on opportunities provided more than 50% of the time. Responsibility for following through in selecting resources, a prominent feature of PBL, was a significant factor in predicting both SDLRS pre and post test scores. Faculty estimated that students followed through on six SDL opportunities more than 50% of the time, on

five opportunities between 25 and 50% of the time, and overall followed through on opportunities provided between 25 and 50% of the time. Generally, faculty perceived that students assumed responsibility for following through on SDL opportunities less that students perceived that they had followed through. This is important because if faculty feel that students will not follow through on SDL opportunities, they might not increase or modify their efforts, thereby limiting student development of readiness for SDL.

Student and faculty experience with learner control and responsibility in PBL

The empirical findings were complemented by the focus group interview analysis, creating a fuller and deeper understanding of self direction in learning within a PBL learning environment. Self direction in learning refers to both the external characteristics of the learning process (learner control) and the internal characteristics of the learner (learner responsibility) (Brockett & Heimstra, 1991; Candy, 1991). Perception of learner control over learning variables is dependent on the individual's perception of the extent to which control over specific variables within the learning environment is available. Perception of learner responsibility is also dependent on the individual's readiness and willingness to engage in the learning process. Despite the individual nature of these perceptions, several recurrent themes related to learner control and responsibility emerged from the focus group data analysis. Some themes identified by the students and faculty were comparable to those identified by PBL students and faculty in other studies while other themes were unique to this study.

Control as mirage

The notion of control and control as a mirage within a PBL learning environment has not been described in other literature. It may have emerged as a unique theme

because this faculty of nursing practices a 'guided discovery' rather than an 'open discovery' approach to PBL (Swanson, Case, & van der Vleuten, 1998). In programs following an 'open discovery' approach to learning, students have responsibility for determining what to learn as well as when and how to learn it, with minimal guidance from tutors. Faculty generated learning objectives and assessment of learning outcomes based on such learning objectives are often viewed as problematic since each student is encouraged to pursue a somewhat different curriculum (Swanson et al., 1998). Objectives identified by faculty and traditional multiple choice tests are often viewed as inappropriate as they may prompt the students to learn 'to the objectives and to the test' thereby compromising the students' abilities to develop skills associated with self directed learning. Consequently, assessment in 'open discovery' programs usually focuses on process variables such as motivation, problem solving, and attitude. Grading in these programs is often established on a pass/fail basis.

In programs following a 'guided discovery' approach specific faculty generated learning goals/objectives guide students in their learning of both process and content. The tutor has a more active role in guiding and challenging the students during the tutorial process. Similar process variables are assessed and students may achieve either a grade or a pass/fail status. In addition, learning outcomes based on the objectives are often assessed through faculty constructed combinations of multiple choice and essay types of evaluation.

To reiterate, this faculty of nursing practices a 'guided discovery' approach to PBL. Students in this study utilized the faculty generated learning goals differently. Some students used the learning goals to guide the initial identification of their learning needs.

Although these students acknowledged that the learning goals reflected what they should know as a minimum for professional nursing practice, they perceived that the content identified by the learning goals was what would be tested. Consequently, they expressed some reluctance to allocate time to explore content beyond what was identified in the learning goals. This would suggest that these students were 'studying to the test" and were not as self directed as they might be in determining their own learning needs. Faculty suggested that these students were constraining their learning and therefore did not achieve depth or breadth in their learning. These findings are consistent with those of Dolman and Schmidt (1994) who found that first year PBL students tended to focus on faculty generated learning goals and on content that might be covered in exams more than students in subsequent years of the program.

Other students in this study used the faculty generated learning goals as a check after they had identified their own learning issues. These students often chose to pursue learning beyond that identified in the faculty generated learning goals which suggests more self direction in determining their own learning needs. Faculty suggested that these students achieved a greater breadth and depth of learning than their peers who focused on the learning goals to identify their learning issues. Overall, faculty described students as eager and willing to learn beyond the faculty generated learning goals which suggests that the presence of the faculty generated learning goals did not hinder the development of self directed learning skills for the students. These findings are consistent with those of Blumberg and Michael (1992) who concluded that the availability of faculty generated learning goals in a PBL program did not alone preclude the development of self directed learning skills. They argued that the key to promoting these skills lies in the consistency

among all aspects of the curriculum, including student generated learning issues, student and faculty goals, content discussed, and outcomes assessed.

Students in this study perceived the greatest amount of control over what strategies they chose to use to learn information related to the topic that they had either chosen or been assigned. They indicated that they chose to use their text books as their primary source of information in first term because it was the common resource for exam content. This finding is substantiated by Dolman and Schmidt (1994) who found that first year students in a 'guided discovery' PBL program tended to rely more on literature cited in faculty generated reference lists than did students in the other three years of the program. By the second term students in this study were expanding their repertoire of learning strategies and making more use of the library. They reported using computerized databases, websites and professional journals more frequently. These findings are consistent with those of studies comparing PBL students with their peers in traditional programs. Blumberg and Michael (1992) reported that PBL students used library resources including texts, journals and computerized bibliographical searches more often than did their peers in traditional programs. In addition to using conventional library resources, the students in this study also used less traditional resources during their self directed learning time. They indicated that they visited community agencies and organizations and also interviewed practicing professionals in a variety of settings. Learning from such a wide variety of resources is behavior that is considered consistent with that of self directed learning (Caffarella, 1983; Candy, 1991). Other strategies that the students identified as helping to facilitate their learning are documented as essential components of the PBL tutorial process. Asking questions of themselves, directing

questions to each other and sharing relevant experiences with each other were strategies identified by students that helped to facilitate their learning and are behaviors congruent with those of self directed learners (Caffarella, 1983; Candy, 1991).

A unique finding of this study was that students clearly identified criteria other than examination results for informally evaluating how effective their learning had been. This finding supports Heliker's (1994) assertion that PBL students can learn to value their own ways of knowing. Despite this ability, the students in this study expressed the greatest lack of control over formal evaluation and more specifically, over examinations. Like the students studied by Biley and Smith (1999), the students in this study expressed anxiety about whether they would know enough about content likely to be examined. Concern over exams, however, is not unique to PBL. Kaufman et al. (1996) reported that while students in PBL ranked concerns about exams as number one, students in traditional programs ranked such concerns as number two. It could be that while traditional program students struggle more with concerns about content and achievement, PBL students are more concerned with possible inconsistencies among student identified learning issues, content discussion that is guided by those learning issues and faculty generated exams. According to Blumberg and Michael (1992), it is this lack of consistency in student control/input into all aspects of the learning process that could interfere with the development of self directed learning skills.

Another unique finding of this study was student dissatisfaction in receiving a pass/fail grade for their tutorial participation. These students clearly indicated that a pass/fail grade did not reflect PBL emphasis on quality tutorial participation and skill achievement. Consequently, students were less likely to consistently focus on developing

the characteristics generally associated with self directed learning. Students indicated that they spent less time on ensuring resource variety, creative sharing, critical evaluation, and quality participation than they would if they were receiving a mark for their tutorial participation. There was general consensus that they wanted a mark for tutorial participation and that a mark should comprise a substantial percentage of their final course grade. Faculty agreed that students should receive tangible credit for their tutorial participation as recognition of their skill development.

Students in this study acknowledged that while they were guided in their learning by the faculty generated learning goals, they controlled how they would learn and the depth of their learning. However, without having any input into the critical variable of how learning would be formally assessed, control over the variables in their learning was incomplete and contributed to a sense of control as mirage. Brookfield concurred that attempts to promote full self directedness (control) on the part of the learners is likely to be an "unattainable and seductive chimera" (pp. 67). He suggested that the realities of curricular imperatives, grading policies, institutionally and professionally derived evaluative criteria, as well as difficulty convincing administrators and skeptical faculty of the validity of self directed learning precluded the attainment of total self direction. Faculty in this study confirmed that while they had a responsibility to assess students during their educational programs, the formal methods of evaluation currently in use in the program stifled the students' abilities to fully direct their learning.

Overwhelmed and uncertain

Feeling overwhelmed and uncertain and the anxiety associated with these feelings are common themes in the research literature related to assuming control and

responsibility for learning (Kasworm, 1983; Stinson & Milter, 1996; Taylor, 1986). A certain degree of student anxiety associated with adapting to PBL may be unavoidable and has been documented by other researchers (O'Hanlon, 1995; Solomon & Finch, 1998). Solomon & Finch (1998) suggested that if PBL students are taking traditional courses concurrently, this anxiety may be accentuated by receiving 'mixed messages' about the amount of self direction expected. Such confusion may delay the students' adaptation to the change the PBL learning environment requires. However, the level of 'panic' expressed by some of the students in this study is a concern. It is likely that such high levels of anxiety actually detract not only from learning but also from the ability of students to develop their self directed learning abilities. There is clearly a need to examine strategies for ameliorating these initial feelings of panic and being overwhelmed. Faculty in this study agreed that students were so anxious initially that they were desperate in their search for structure. Students themselves identified the need for a more structured orientation as one way to decrease the initial anxiety that they felt when starting the PBL program.

The uncertainty expressed by the students in this study related primarily to concerns about the depth and breadth of their learning. These findings are consistent with those of Solomon and Finch (1998) and Kaufman et al. (1996). Like students in other studies (Biley & Smith, 1999; Lunyk-Child et. al, 2001)), these students were also uncertain about how well prepared they would be for their professional examinations and for professional practice. A unique finding of this study is that faculty tutors also expressed a high degree of uncertainty. Each time they encountered a new group of students, tutors wondered what the PBL experience would be like with that particular

group. Occasionally, tutors felt uncertain about their familiarity with the content related to the learning issues that the students identified. They also felt uncertain about how much control they could really allow students given the formal course evaluation requirements. Tutors acknowledged these uncertainties, and indicated that while these particular uncertainties had decreased with time other uncertainties had emerged.

Concerns about inadequate time and an overwhelming volume of information are also not unique to PBL. Kaufman et al. (1996) found that compared to traditional programs, time concerns were actually less in the PBL program. Solomon and Finch (1998) hypothesized that there were subtle differences in the time pressures experienced by students in PBL compared to students in traditional programs. They suggested that traditional program students seemed to struggle with the number of scheduled hours and corresponding workload, whereas PBL students spent more time searching and accessing resources and trying to determine when they had achieved an appropriate degree of breadth and depth in their learning. Similar to the students in other studies (Williams, Saarinen, & Norman, 1995) these students reported that increased instructional time spent in other courses generally lead to a decreased amount of time spent in self directed learning. The students in this study confirmed that time pressures also influenced the variety of resources that they chose to use and the creativity that they used in sharing information with colleagues. Faculty in this study agreed that while some students were very creative and used a wide variety of resources, students generally displayed these behaviors less frequently than did previous student cohorts who had spent less time in face to face contact with support course disciplines. There is some evidence to suggest that this could change as students progress through the program and are carrying fewer

support courses. Williams et al. (1995) found that students in subsequent program years used their time more effectively as they become better at determining the depth of information required and more efficient at accessing resources.

Tutor as guide

As the term progressed students experienced a sense of confidence in themselves and responsibility for themselves and colleagues. The tutor role was considered a key factor in assisting students to move from feeling overwhelmed and uncertain to feeling confident and responsible. Students in this study suggested that they felt more in control of their learning if tutors were credible as professionals, confident as tutors and consistent in their behaviors.

A common assumption in the literature is that PBL tutors do not necessarily need to be familiar with content knowledge as long as they are skilled in the tutoring process (Barrow, 1980; Branda, 1990; Silver & Wilkerson, 1991). Students in this study clearly indicated that content knowledge familiarity was a major determinant of tutor credibility. If the tutor was credible as a professional, students trusted that the tutor would guide them through the process and they felt more in control of their learning. Several researchers (Albanese & Mitchell, 1993; Schmidt, Arend, Moust, Kokx & Boon, 1993) concluded that PBL students guided by content familiar tutors spent more time on self directed study and achieved somewhat better on exams than students guided by tutors who were not familiar with the content. These effects were strongest in the first year of the curriculum, suggesting that novice students, like those involved in this study, require more guidance than advanced students. Content familiar tutors are also more likely to use their knowledge to guide students through critical questioning in order to facilitate an in

depth pursuit of disciplinary concepts and conceptual relationships. (Creedy et al, 1993; Schmidt et al., 1993; Schmidt, 1994; Schmidt & Moust, 1995). The ways tutors choose to use their knowledge can also influence how students use their self directed learning time. It is important that tutors balance student self directedness with guidance and sharing professional knowledge without lecturing (Wilkerson, 1995). Researchers (Engel, 1995; Schmidt and Moust, 1995) have found that the more the tutor contributed to the discussion by providing information, the less time students spent in self directed learning. This finding suggests that in addition to possessing content familiarity, tutors must demonstrate effective tutor processing skills if they want to be able to facilitate the development of students' abilities to direct their own learning.

Unlike the students in some studies (Solomon & Finch, 1998) these students were able to clearly articulate their understanding of the tutor as a facilitator of learning and the value of that role in facilitating the students' abilities to take control of their learning. They were quite clear that tutors needed to achieve a balance between constantly intervening and non participation. Students indicated that constant tutor intervention undermined their confidence and inhibited their learning through inhibiting the tutorial process. Little or no tutor participation could indicate either a lack of interest in student progress and achievement or a misunderstanding of the tutor role. These findings are consistent with those of other studies describing student response to the tutor role (Andrews & Reese, 1996; Biley & Smith, 1999; Des Marchais, 1993; Johnston & Tinning, 2001; Stinson & Milter, 1996; White, Amos & Kouzekanini, 1999; Wilkerson, 1995). Achieving this role balance has been identified as a complex challenge for tutors

and tutor development programming (Doring et al., 1995; Andrews & Jones, 1996, Creedy et al, 1992).

According to the students in this study, tutors were able to best facilitate self directed learning by guiding rather than directing, providing feedback to ensure information relevancy and role modeling professional behaviors related to communication and leadership in particular. Knowing when to redirect students, when to point out neglected aspects of the situation, when to answer a student question directly and when to guide the student to an answer through a series of questions were identified by these and other students as critical guiding skills for a tutor to possess (Andrews & Reese, 1996; Biley & Smith, 1999; Des Marchais, 1993; Lunyk-Child et. al, 2001; Rideout, 1999; White, Amos & Kouzekanini, 1999; Wilkerson, 1995). The ability of the tutor to role model critical appraisal of information and resources, stimulation of discussion through critical questioning, and provision of constructive criticism to individuals was another unique finding of this study. Although the theoretical literature emphasizes the importance of the tutor role modeling desired behaviors, few references could be found in the research literature. Perhaps the students in this study had a clear understanding of the role of tutor as facilitator and were also aware that these skill sets had been identified as outcome competencies of their professional education program, they wanted to ensure that they developed these abilities. Faculty were able to identify the importance of their role in acting as a resource to students and in guiding student learning through questioning.

Confident and responsible

Self directed learners have been characterized as interdependent; responsible; confident; able to seek, retrieve, evaluate, and share information in a variety of ways; creative; analytical; open to other points of view; tolerant of ambiguity; reflective and self aware; and motivated to continue to learn (Caffarella, 1983, Candy, 1991 ; Frost, 1996; Gugliemino, 1977; Oddi, 1985/98). Although the PBL theoretical literature reflects the importance of these characteristics in the development of SDL abilities, few references to these characteristics were found in the research literature. The students in this study indicated that the tutorial process and skilled tutor interaction were critical in helping them develop their abilities to be self directed in their learning. Unlike the students in Biley and Smith's (1999) study, these students valued the development of these abilities as outcomes of PBL.

Students in this study were very conscious of the interdependence and relationships between themselves and their tutor. They recognized the sense of responsibility that they were developing in being able to work cooperatively with others, to learn from others and to creatively share information with others. Students indicated that they were confident in their ability to identify their learning needs, select and use a variety of sources of information, choose relevant information and share their information in a variety of ways. They were also able to informally evaluate the effectiveness of their learning activities. Students acknowledged that they were learning how to effectively question each other, deal with ambiguity and value a diversity of viewpoint. Students commented that through the process of regular self and peer reflection they were developing a deeper awareness of themselves and others and were increasingly able to

communicate their observations to each other. Like students in other studies (Solomon & Finch, 1998) these students reported that the processes of self and peer evaluation created discomfort. Performing a self evaluation in front of colleagues and the tutor and providing constructive criticism to peers and tutor are situations that students have not likely encountered before. Finally, students indicated that they were developing the skills that would enable them to continue to learn once they were practicing professionals. The findings of this study are congruent with those of White, Amos and Kouzekanani (1999) who reported that students identified critical thinking, learning how to learn, creativity, teamwork, research skills and personal growth as outcomes of their PBL program. These outcomes are congruent with the documented characteristics of self directed learners.

The gradual change from feelings of uncertainty to feelings of confidence that these PBL students experienced is supported by the SDL literature. Kasworm (1983) describes a similar process comprised of five components that depict change over time: from student dependence on authority to independence; from extrinsic to intrinsic motivation for learning; from passive acceptance of information to active inquiry and critical appraisal of information; from authority designed learning structures to student selected ones; from unidimensional to multidimensional strategies for planning and conducting personal and group learning activities. Taylor (1986) describes four phases involved in moving towards SDL that include disorientation, exploration, reorientation, and equilibrium. Cranton (1992) expanded on Taylor's stages of the SDL process by suggesting a variety of possible outcomes that include rejection, acceptance and equilibrium, or advocacy of SDL.

PBL works and makes sense

Within the current structure of PBL students did identify a variety of factors that diminished the control that they felt they could have had over their learning. Lack of time, no input into exams and inconsistent tutor guidance were the most frequently identified issues. They were also able to suggest a variety of strategies for dealing with the issues that they had identified. Despite the fact that they identified issues with the implementation of PBL, students reported that PBL made sense to them as it reflected accurately how they would need to practice as professional nurses.

Students were aware that the situations chosen to comprise the nursing courses were derived from practice. Similar to the PBL students in White et al. (1999) study, these students reported that because PBL was based in reality, working through each situation helped them develop the cognitive and affective skills that they would need to be effective in professional nursing practice. Like the students in Stern's (1996) study, students in this study felt that PBL helped them integrate knowledge from a variety of disciplines, contributed to their self confidence, fostered their clinical reasoning skills, enhanced their professional behavior, prepared them for continued self directed learning, and affected them personally.

Summary

Several notable findings were obtained as a result of this study. While students in this PBL undergraduate nursing program demonstrated average SDLR scores, their faculty demonstrated above average SDLR scores. Although SDLR scores for both students and faculty increased after one year in this PBL program, the increase was not significant. Several factors that have been identified in the literature as influencing SDLR

were examined: age and SDLRS were positively correlated for students but negatively correlated for faculty; although male students scored higher on the pre test than female students, the reverse was true for the post test; students with some college/university and those with previous degrees displayed higher degrees of SDLR; prior SDL instruction was positively correlated to student SDLR scores while prior experience with SDL projects was negatively correlated with their SDLR scores; previous involvement in PBL positively correlated with faculty SDLR scores.

Students in this PBL program indicated that they had an opportunity to control the majority of the variables involved in their learning (learner control) more than students in other studies which utilized traditional programs of undergraduate nursing education . The students' perceptions of their opportunity to select resources, their overall opportunity to control the majority of variables involved in their learning and their opportunity to determine criteria for evaluation were significant predictors of both their pre and post test SDLR scores. Faculty and student perceptions of the degree of SDL opportunities provided for students were very similar. Students in this PBL program were also willing to follow through on the opportunities provided for them to control the majority of variables involved in their learning (learner responsibility) and they felt they did so almost half of the time. The students' perception of their follow through in selecting resources was a significant predictor of their post test SDLR scores. Faculty generally underestimated student responsibility in following through on SDL opportunities that they had provided.

Students in this PBL program who participated in focus group interviews were able to describe themselves as developing many of the characteristics commonly

associated with self directed learners. Students identified themselves as interdependent; responsible; cooperative; confident; able to seek, retrieve and share information in a variety of creative ways; analytical; open to other points of view; tolerant of ambiguity; reflective; self aware; and motivated to continue to learn. They suggested that PBL affected them personally, contributed to their self confidence, helped them integrate knowledge from a variety of disciplines, fostered clinical reasoning skills, enhanced their professional behavior and prepared them for continuing self directed learning. The key role of the PBL tutor in facilitating self directed learning readiness was repeatedly emphasized.

Comments on procedure and instrumentation

Several questions can be raised about the methods of the present study. Although the student sample was one of convenience, the number of students who chose to participate was 91% of the total population so there was no clear indication of how the sample might be biased. The small faculty sample size could contribute to bias, so faculty results must be interpreted with caution. Researcher influence was a possibility since the researcher had been a tutor in the program, was a tutor in year three of the program at the time of the study and had been a tutor colleague to faculty in the study. Several strategies were used to minimize researcher influence. Written scripts were strictly followed to prevent any variation in presentation of information to the participants and a co-moderator was present for the focus group interviews. In addition, students and faculty were provided with summary statements of the focus group discussion and asked to verify the accuracy of the statements. While subjective judgment is involved in the

analysis and interpretation of focus group data (Knodel, 1994) having the researcher and co-moderator code and analyze the data independently minimized subjectivity.

Conditions of testing may have influenced student responses as some students completed the questionnaires at the beginning of class while others completed them at the end of class. Daily fluctuations in student affect, attitudes towards PBL and completing the questionnaires may also have affected their responses. Although some of these factors were beyond the control of the researcher, it is assumed that students responded to all items in a truthful manner.

Testing bias may have been a factor in this study. The SDLRS pre test and post test were identical so it is possible that the slight improvement in SDLRS might be due to student and faculty experience with the test. It could also be that the small increase in SDLRS occurred because students and faculty expected consciously or unconsciously to change over the time of the study.

Errors may have occurred in student scoring as well as in researcher transcription of data from questionnaires to computer file. In order to minimize and monitor potential transcription errors, 10% of randomly selected computer data entries were visually verified by comparison to the original questionnaire responses. Only two errors were detected.

The focus of this study precluded an exhaustive consideration of variables outside the nursing program which may have affected the student SDLR scores. No comparison was made to students in a more traditional program and alternate SDLR assessment strategies such as student observation in the classroom or clinical settings were not included.

Although this study permitted assessment of SDLR over the period of one academic year, it did not permit assessment of the same students over an extended period of time. PBL was a unique and disruptive experience for the majority of students in this program. It is possible that the slight initial increase in SDLRS after one year in the program might increase from one year to the next and from program entry to program completion as students assimilate PBL into their repertoire of learning. It is also possible that SDLR might decrease or remain the same over time. Since the students were clearly able to describe themselves as developing the characteristics of self directed learners during the focus group interviews, it is also possible that the SDLRS measures something other than self directed learning readiness.

With the exception of those findings supported by the research literature, the findings of this study should be interpreted with caution since they may not apply to baccalaureate nursing students, faculty or programs which differ markedly from those used in this study sample.

Implications for Nursing Education

This study raises issues for action in the areas of PBL education and research in nursing education. The findings support the need for student orientation to PBL. Students from high school and/or other university programs will generally need to make a transition from more traditional educational approaches to PBL which emphasizes critical thinking, self direction, and collaboration as central strategies for learning. Assisting students with this transition is critical in order to realize the potential of PBL

Faculty also require orientation to the role of tutor and ongoing support in order to maximize their effectiveness. Learning how to introduce PBL to students, role model

critical appraisal of information and resources, stimulate discussion through critical questioning and provide constructive criticism during early PBL experiences should be essential elements in any faculty development program. Learning how to coach and then let go as students develop their own confidence and skills should also be part of faculty development. Central to the tutor role is a unique relationship with students. PBL requires that tutors foster a climate of mutual respect, collaboration, trust, support and openness (Pratt, 1993). The critical value defining the tutor role is balance. Tutors are most effective when they can balance student directedness with guidance and sharing professional knowledge without lecturing.

It is critical that faculty ensure consistency among all aspects of the PBL curriculum. Consistent opportunities for student control and input into all aspects of the learning process will enhance the development of self directed learning skills. If students are encouraged to control what they will learn and how they will learn it, within the structure of the PBL curriculum, then they should have some input into how program outcomes are formally assessed. This could be through the mechanism of open ended short answer exam questions, student suggestions and/or contributions to the creation of multiple choice exam questions, topical choices for scholarly papers, receiving numerical credit for tutorial participation and/or contracting for course grades.

Throughout the process, there is a need for students and faculty to continually appraise the extent to which opportunities for SDL are provided to students within a PBL context. This is important because if faculty overestimate the frequency with which they provide this type of learning experience for students, they may not be aware of the need to increase their efforts and thereby limit students' development of readiness for self

directed learning. If students underestimate the frequency with which they receive SDL experiences, they may underestimate their knowledge and skill in this area and hesitate to undertake SDL activities after graduation.

Active involvement in learning needs to remain a priority if the profession hopes to produce graduates who have the aptitude as well as the attitude to continue their professional education in a self directed manner following graduation.

Figure 1 illustrates a preliminary conceptual model intended to assist curriculum planners and faculty in facilitating SDL through a PBL program. Self direction in learning encompasses dimensions related to the external characteristics of the learning process and the internal characteristics of the learner. These dimensions are commonly described in the literature as learner control and learner responsibility. Learner control is generally described as the amount of control learners have over what to learn, how to learn it and how they will know when they have learned. Learner responsibility is generally described in terms of willingness and readiness to enact the process of self directed learning. The conceptual framework for this study involved these common dimensions of SDL.

As illustrated in the model, a PBL curriculum provides opportunities for nursing students to take responsibility for controlling the majority of variables in their learning. Working in small peer groups with a skilled faculty tutor, nursing students are presented with an authentic professional practice situation that reflects a number of important disciplinary and cross disciplinary concepts and issues. Within the PBL process students have control and responsibility over deciding which concepts and issues to pursue as a group and which ones relate to individual learning needs. Students have control and

responsibility for choosing and using resources and strategies that will help them fulfill learning needs that have been identified. With tutor guidance students synthesize, share, and critically appraise their researched information. Through participating in both self and peer evaluation, students are able to develop the characteristics commonly associated with self directed learners. Several of these characteristics are often reflected in the outcome competencies for graduates of baccalaureate nursing programs. The desired graduate from a professional nursing education program is often described as an autonomous, critically reflective, collaborative practitioner who engages in continually competent, evidence based practice.

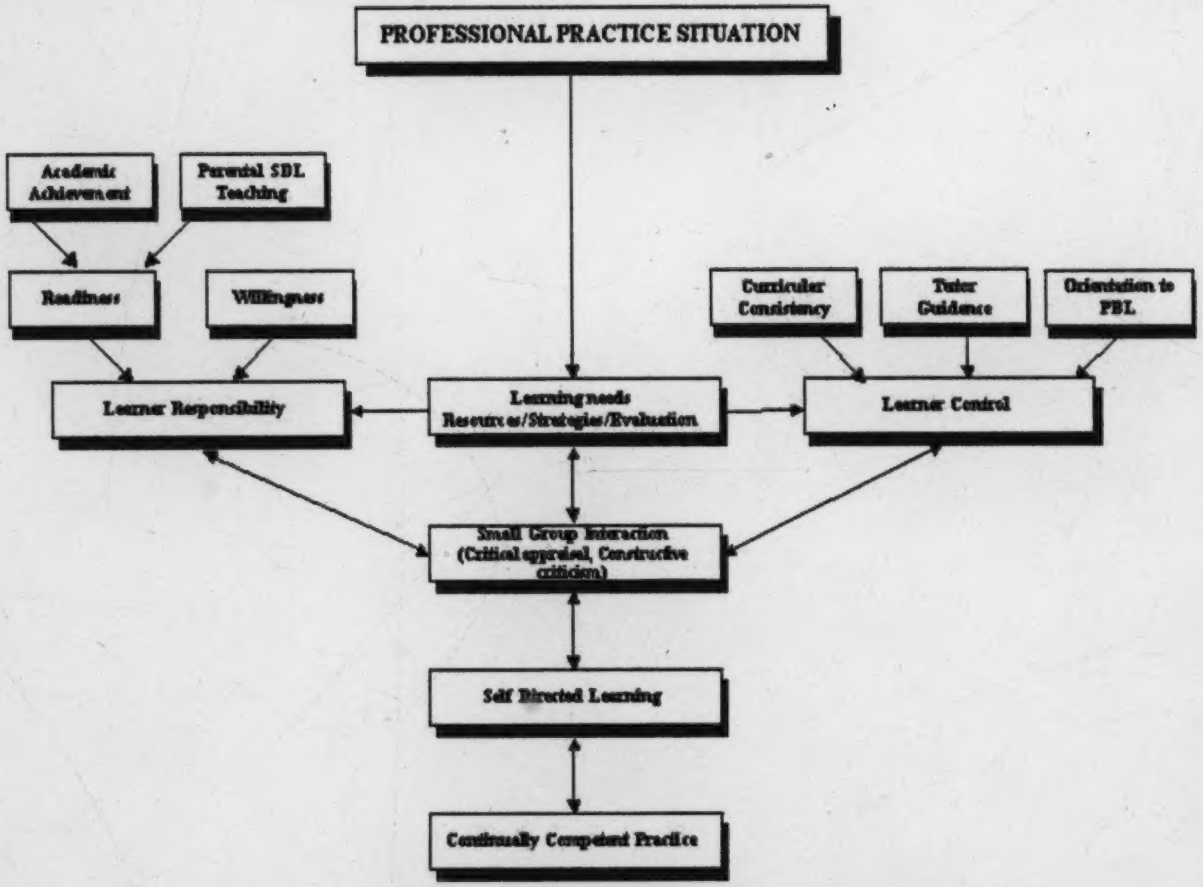

Figure 1: A Conceptual Model for Facilitating SDL Through PBL

Implications for Research in Nursing

Careful examination of the findings of this study and review of the PBL and SDL literature suggest the need for additional research in a variety of areas. Determining effective approaches to orient students to PBL and studying how they adapt to PBL will be beneficial in assisting students to adjust to all aspects of PBL. Examining faculty development needs related to PBL, determining effective ways to prepare faculty for the tutor role, exploring outcomes of faculty development and determining if there is a congruence between the beliefs and actions of faculty who claim to endorse PBL will contribute to knowledge about tutor development and the relationship of the tutor to the effectiveness of PBL in fostering self directed learning. Triangulation using tutorial observation, tutor evaluation of students and the SDLRS will allow for more conclusive statements about the predictive value of the SDLRS in a PBL context.

Replication of this study with comparisons between traditional program students and faculty and PBL program students and faculty will allow for a more complete understanding about the influence of PBL in facilitating the development of student self directed learning readiness. Serial measurement of student SDLRS on entry and end of each academic year in the program will ameliorate the disruption effects evident in this study and determine changes in SDL over the duration of the program.

For initial socialization into the profession, students are often in the clinical area with faculty tutors or clinical preceptors. It could be that there is an association between clinical faculty tutor and/or preceptor role modeling and student level of self directed learning readiness. This relationship should be explored with consideration of how

clinical faculty and preceptors are encouraged to facilitate the development of SDLR in the clinical setting.

Correlational studies to determine the relationship between SDLRS in a PBL context, student grades, and Canadian Registered Nurses Examination results, professional practice performance, and professional continuing competence are essential to determine if PBL programs are preparing graduates for professional entry to practice.

Conclusion

Baccalaureate nursing graduates must enter their professional careers with the understanding and ability to engage in continuous learning. These skills are essential to ensure continuing competence in professional practice. The graduate's ability to be self directed in learning is an important indication of the ability to pursue continuing learning as a professional practitioner. Professional nursing education programs must be capable of fostering the development of self directed learning abilities. It has been surmised that PBL nursing programs facilitate the development of abilities to become self directed in learning. Although the self directed learning nature of PBL has been identified repeatedly as a strength, there has been little evidence in the research literature that the process does indeed influence the self directedness of students.

This study involved students enrolled in the first year of an undergraduate program that utilized a PBL approach to undergraduate nursing education. Even though the student gains in SDLR using Guglielmino's SDLRS were not significant, students clearly indicated that they felt that they had control over the majority of variables involved in their learning between 50-75% of the time and that they were responsible for following through on those opportunities as least half of the time.

Focus group interviews allowed for more specific identification of SDL characteristics as students adapted to the different learning skills required for PBL. This extends the findings of previous work based on questionnaires only, which may have limited the scope of student response. Additional studies that compare traditional program students with PBL students are required. This study illustrates the value of PBL in providing opportunities for control over variables involved in learning. It also indicates that students in this PBL program assumed responsibility for following through on opportunities provided. This study also confirmed the centrality of the tutor role in relation to facilitating student development of self directed learning skills and abilities. As educators we can begin to incorporate these findings into practice and continue to investigate the process and outcomes of PBL in undergraduate nursing education.

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Appendix A
Student Questionnaire (Entry)
Part 1

1. Code number _ _ _ _

2. Course name _____

3. Age in years _____

4. Gender
___ 1. Male
___ 2. Female

5. Highest level of academic achievement before admission
___ 1. High school diploma or equivalent
___ 2. Some college level courses
___ 3. Some university level courses
___ 4. Diploma or certificate
___ 5. Baccalaureate degree
Specify _____

6. Completion of courses/workshops designed to teach you to take control of your own learning
___ Yes, I took such a course ____ years ago
___ No, I have never taken such a course

7. Previous involvement with problem based learning
___ Yes, I took a problem based learning course/program ____ years ago
___ No, I have never taken such a course/program

Part 2

QUESTIONNAIRE

INSTRUCTIONS: This is a questionnaire designed to gather data on learning preferences and attitudes towards learning. After reading each item, please indicate the degree to which you feel that statement is true of you. Please read each choice carefully and circle the number of the response which best expresses your feeling.

There is no time limit for the questionnaire. Try not to spend too much time on any one item, however. Your first reaction to the question will usually be the most accurate.

ITEMS:	RESPONSES					
	Almost never true of me: I hardly ever feel this way.	Not often true of me: I feel this way less than half the time.	Sometimes true of me: I feel this way about half the time.	Usually true of me: I feel this way more than half the time.	Almost always true of me: there are very few times when I don't feel this way.	
1. I'm looking forward to learning as long as I'm living.	1	2	3	4	5	
2. I know what I want to learn.	1	2	3	4	5	
3. When I see something that I don't understand, I stay away from it.	1	2	3	4	5	
4. If there is something I want to learn, I can figure out a way to learn it.	1	2	3	4	5	
5. I love to learn.	1	2	3	4	5	
6. It takes me a while to get started on new projects.	1	2	3	4	5	
7. In a classroom, I expect the teacher to tell all class members exactly what to do at all times.	1	2	3	4	5	
8. I believe that thinking about who you are, where you are, and where you are going should be a major part of every person's education.	1	2	3	4	5	
9. I don't work very well on my own.	1	2	3	4	5	

	Almost never true of me: I hardly ever feel this way.	Not often true of me: I feel this way less than half the time.	Sometimes true of me: I feel this way about half the time.	Usually true of me: I feel this way more than half the time.	Almost always true of me: there are very few times when I don't feel this way
10. If I discover a need for information that I don't have, I know where to go to get it.	1	2	3	4	5
11. I can learn things on my own better than most people.	1	2	3	4	5
12. Even if I have a great idea, I can't seem to develop a plan for making it work.	1	2	3	4	5
13. In a learning experience, I prefer to take part in deciding what will be learned and how.	1	2	3	4	5
14. Difficult study doesn't bother me if I'm interested in something.	1	2	3	4	5
15. No one but me is truly responsible for what I learn.	1	2	3	4	5
16. I can tell whether I'm learning something well or not.	1	2	3	4	5
17. There are so many things I want to learn that I wish that there were more hours in a day.	1	2	3	4	5
18. If there is something I have decided to learn, I can find time for it, no matter how busy I am.	1	2	3	4	5
19. Understanding what I read is a problem for me.	1	2	3	4	5
20. If I don't learn, it's not my fault.	1	2	3	4	5
21. I know when I need to learn more about something.	1	2	3	4	5
22. If I can understand something well enough to get a good grade on a test, it doesn't bother me if I still have questions about it.	1	2	3	4	5
23. I think libraries are boring places.	1	2	3	4	5
24. The people I admire most are always learning new things.	1	2	3	4	5

	Almost never true of me: I hardly ever feel this way.	Not often true of me: I feel this way less than half the time.	Sometimes true of me: I feel this way about half the time.	Usualy true of me: I feel this way more than half the time.	Almost always true of me: there are very few times when I don't feel this way
25. I can think of many different ways to learn about a new topic.	1	2	3	4	5
26. I try to relate what I am learning to my long-term goals.	1	2	3	4	5
27. I am capable of learning for myself almost anything I might need to know.	1	2	3	4	5
28. I really enjoy tracking down the answer to a question.	1	2	3	4	5
29. I don't like dealing with questions where there is not one right answer.	1	2	3	4	5
30. I have a lot of curiosity about things.	1	2	3	4	5
31. I'll be glad when I'm finished learning.	1	2	3	4	5
32. I'm not as interested in learning as some other people seem to be.	1	2	3	4	5
33. I don't have any problem with basic study skills.	1	2	3	4	5
34. I like to try new things, even if I'm not sure how they will turn out.	1	2	3	4	5
35. I don't like it when people who really know what they're doing point out mistakes that I am making.	1	2	3	4	5
36. I'm good at thinking of unusual ways to do things.	1	2	3	4	5
37. I like to think about the future.	1	2	3	4	5
38. I'm better than most people are at trying to find out the things I need to know.	1	2	3	4	5
39. I think of problems as challenges, not stopsigns.	1	2	3	4	5
40. I can make myself do what I think I should.	1	2	3	4	5

	Almost never true of me: I hardly ever feel this way.	Not often true of me: I feel this way less than half the time.	Sometimes true of me: I feel this way about half the time.	Usually true of me: I feel this way more than half the time.	Almost always true of me: there are very few times when I don't feel this way.
41. I'm happy with the way I investigate problems.	1	2	3	4	5
42. I become a leader in group learning situations.	1	2	3	4	5
43. I enjoy discussing ideas.	1	2	3	4	5
44. I don't like challenging learning situations.	1	2	3	4	5
45. I have a strong desire to learn new things.	1	2	3	4	5
46. The more I learn, the more exciting the world becomes.	1	2	3	4	5
47. Learning is fun.	1	2	3	4	5
48. It's better to stick with the learning methods that we know will work instead of always trying new ones.	1	2	3	4	5
49. I want to learn more so that I can keep growing as a person.	1	2	3	4	5
50. I am responsible for my learning — no one else is.	1	2	3	4	5
51. Learning how to learn is important to me.	1	2	3	4	5
52. I will never be too old to learn new things.	1	2	3	4	5
53. Constant learning is a bore.	1	2	3	4	5
54. Learning is a tool for life.	1	2	3	4	5
55. I learn several new things on my own each year.	1	2	3	4	5
56. Learning doesn't make any difference in my life.	1	2	3	4	5
57. I am an effective learner in the classroom and on my own.	1	2	3	4	5
58. Learners are leaders.	1	2	3	4	5

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Appendix B

Faculty Questionnaire (Entry)
Part 1

1. Code number _ _ _ _

2. Course name _____

3. Age in years _____

4. Gender
   ___ 1. Male
   ___ 2. Female

5. Teaching experience in years _____

6. Highest level of academic achievement in nursing
   ___ 1. Baccalaureate degree in nursing
   ___ 2. Masters degree in nursing
   ___ 3. Doctoral degree in nursing

7. Highest level of academic achievement outside of nursing
   ___ 1. Baccalaureate degree
   Specify field _____
   ___ 2. Masters degree
   Specify field _____
   ___ 3. Doctoral degree
   Specify field _____

8. Previous involvement with problem based learning
   ___ Yes, I took a problem based learning course/program ____ years ago
   ___ No, I have never taken such a course/program
   ___ Yes, I have been involved in teaching in a problem based learning curriculum for ____ years
   ___No, I have not been involved in teaching in a problem based learning curriculum

Part 2

QUESTIONNAIRE

INSTRUCTIONS: This is a questionnaire designed to gather data on learning preferences and attitudes towards learning. After reading each item, please indicate the degree to which you feel that statement is true of you. Please read each choice carefully and circle the number of the response which best expresses your feeling.

There is no time limit for the questionnaire. Try not to spend too much time on any one item, however. Your first reaction to the question will usually be the most accurate.

ITEMS:	RESPONSES					
	Almost never true of me: I hardly ever feel this way.	Not often true of me: I feel this way less than half the time.	Sometimes true of me: I feel this way about half the time.	Usually true of me: I feel this way more than half the time.	Almost always true of me: there are very few times when I don't feel this way.	
1. I'm looking forward to learning as long as I'm living.	1	2	3	4	5	
2. I know what I want to learn.	1	2	3	4	5	
3. When I see something that I don't understand, I stay away from it.	1	2	3	4	5	
4. If there is something I want to learn, I can figure out a way to learn it.	1	2	3	4	5	
5. I love to learn.	1	2	3	4	5	
6. It takes me a while to get started on new projects.	1	2	3	4	5	
7. In a classroom, I expect the teacher to tell all class members exactly what to do at all times.	1	2	3	4	5	
8. I believe that thinking about who you are, where you are, and where you are going should be a major part of every person's education.	1	2	3	4	5	
9. I don't work very well on my own.	1	2	3	4	5	

Appendix C

Student Questionnaire (Completion)
Part I

QUESTIONNAIRE

INSTRUCTIONS: This is a questionnaire designed to gather data on learning preferences and attitudes towards learning. After reading each item, please indicate the degree to which you feel that statement is true of you. Please read each choice carefully and circle the number of the response which best expresses your feeling.

There is no time limit for the questionnaire. Try not to spend too much time on any one item, however. Your first reaction to the question will usually be the most accurate.

ITEMS:	RESPONSES					
	Almost never true of me: I hardly ever feel this way.	Not often true of me: I feel this way less than half the time.	Sometimes true of me: I feel this way about half the time.	Usually true of me: I feel this way more than half the time.	Almost always true of me: there are very few times when I don't feel this way.	
1. I'm looking forward to learning as long as I'm living.	1	2	3	4	5	
2. I know what I want to learn.	1	2	3	4	5	
3. When I see something that I don't understand, I stay away from it.	1	2	3	4	5	
4. If there is something I want to learn, I can figure out a way to learn it.	1	2	3	4	5	
5. I love to learn.	1	2	3	4	5	
6. It takes me a while to get started on new projects.	1	2	3	4	5	
7. In a classroom, I expect the teacher to tell all class members exactly what to do at all times.	1	2	3	4	5	
8. I believe that thinking about who you are, where you are, and where you are going should be a major part of every person's education.	1	2	3	4	5	
9. I don't work very well on my own.	1	2	3	4	5	

Part 2

Self directed learning has been described as learning in which the majority of the following learning variables are controlled by the learner:

1. Identification of learning needs
2. Topic of learning activity
3. Purpose of the learning activity
4. Objectives or expected outcomes
5. Appropriate learning experiences
6. Evidence that objectives were achieved
7. Environment (where learning occurs)
8. Learning resources
9. Time (when learning occurs)
10. Pace (how fast learning occurs)
11. Methods of evaluation

(Cooper, 1980)

Please answer the remainder of the questionnaire with this description in mind.

1. Prior to enrolling in this baccalaureate nursing program, did you participate in learning projects in which YOU controlled the majority of the learning variables listed above?
   ____ Yes
   ____ No

2. If "yes", from what source did you experience this type of learning?
   ____ Elementary school
   ____ High school
   ____ College courses
   ____ University courses
   ____ Prior or current job
   ____ Parents
   ____ Peers (other students, friends)
   ____ Other sources
   Specify _____

3. Have you ever received instruction in self directed learning?
   ____ Yes
   ____ No

4. If "yes" from what source did you experience this type of instruction?
   ____ Elementary school
   ____ High school
   ____ College courses
   ____ University courses
   ____ Prior or current job
   ____ Parents
   ____ Peers (other students, friends)
   ____ Other sources

Think about the types of learning **experiences which you have had** during tutorial in your nursing program at this faculty of nursing. Keep those experiences in mind as you answer the following questions.

Directions

This set of questions asks you to estimate the frequency (percent of time) with which **you were provided certain types of learning opportunities** during tutorial in this faculty of nursing. Write the NUMBER of the response which best represents your estimate. Use "1" for "00% of the time" and "5" for "100% of the time".

Percent	(00%)	(25%)	(50%)	(75%)	(100%)
Number	1	2	3	4	5

____ 5. At this faculty of nursing, how often have YOU been given the opportunity to decide WHAT you needed to learn?

____ 6. At this faculty of nursing, how often have YOU been given the opportunity to determine the TOPIC of your learning ?

____ 7. At this faculty of nursing, how often have YOU been given the opportunity to determine the PURPOSE of your learning ?

____ 8. At this faculty of nursing, how often have YOU been given the opportunity to identify your own OBJECTIVES (or EXPECTED OUTCOMES) of your learning?

____ 9. At this faculty of nursing, how often have YOU been given the opportunity to select the LEARNING ACTIVITIES (eg. reading, interviewing, videos) that you felt were most relevant for your learning ?

____ 10. At this faculty of nursing, how often have YOU been given the opportunity to select the RESOURCES (eg. Books, journals, videotapes, resource people) that you thought would help meet your learning objectives?

____ 11. At this faculty of nursing, how often have YOU been given the opportunity to determine WHERE your learning would take place?

____ 12. At this faculty of nursing, how often have YOU been given the opportunity to determine WHEN your learning activities would occur?

___ 13. At this faculty of nursing, how often have YOU been given the opportunity to decide the PACE at which your learning activities would occur?

____ 14. At this faculty of nursing, how often have YOU been given the opportunity to identify HOW your learning would be EVALUATED (eg. tutorial process, oral report, paper, written test)?

____ 15. At this faculty of nursing, how often have YOU been given the opportunity to determine the CRITERIA to be used for EVALUATING your learning (eg. criteria for tutorial process, grading papers, passing test score)?

_____16. At this faculty of nursing OVERALL how often have you been given the opportunity to control the majority of variables involved in your learning?

Part 3

Think about the types of learning **experiences which you have been offered** during tutorial in your nursing program at this faculty of nursing. Keep those experiences in mind as you answer the following questions.

Directions

This set of questions asks you to estimate the frequency (percent of time) with which **you followed through on learning opportunities offered** during tutorial in this faculty of nursing. Write the NUMBER of the response which best represents your estimate. Use "1" for "00% of the time" and "5" for "100% of the time".

Percent	(00%)	(25%)	(50%)	(75%)	(100%)
Number	1	2	3	4	5

____ 5. At this faculty of nursing, how often have YOU followed through on opportunities to decide WHAT you needed to learn?

____ 6. At this faculty of nursing, how often have YOU followed through on opportunities to determine the TOPIC of your learning ?

____ 7. At this faculty of nursing, how often have YOU followed through on opportunities to determine the PURPOSE of your learning ?

____ 8. At this faculty of nursing, how often have YOU followed through on opportunities to identify your own OBJECTIVES (or EXPECTED OUTCOMES) of your learning?

____ 9. At this faculty of nursing, how often have YOU followed through on opportunities to select the LEARNING ACTIVITIES (eg. reading, interviewing, videos) that you felt were most relevant for your learning ?

____ 10. At this faculty of nursing, how often have YOU followed through on opportunities to select the RESOURCES (eg. Books, journals, videotapes, resource people) that you thought would help meet your learning objectives?

____ 11. At this faculty of nursing, how often have YOU followed through on opportunities to determine WHERE your learning would take place?

___ 12. At this faculty of nursing, how often have YOU followed through on

opportunities to determine WHEN your learning activities would occur?

____ 13. At this faculty of nursing, how often have YOU followed through on opportunities to decide the PACE at which your learning activities would occur?

____ 14. At this faculty of nursing, how often have YOU followed through on opportunities to identify HOW your learning would be EVALUATED (eg. tutorial process, oral report, paper, written test)?

____ 15. At this faculty of nursing, how often have YOU followed through on opportunities to determine the CRITERIA to be used for EVALUATING your learning (eg. criteria for tutorial process, grading papers, passing test score)?

_____16. At this faculty of nursing, OVERALL how often have YOU followed through on opportunities to control the majority of variables involved in your learning?

Thank you for participating in this study.

Appendix D

Faculty Questionnaire (Completion)
Part 1

QUESTIONNAIRE

INSTRUCTIONS: This is a questionnaire designed to gather data on learning preferences and attitudes towards learning. After reading each item, please indicate the degree to which you feel that statement is true of you. Please read each choice carefully and circle the number of the response which best expresses your feeling.

There is no time limit for the questionnaire. Try not to spend too much time on any one item, however. Your first reaction to the question will usually be the most accurate.

ITEMS:	RESPONSES				
	Almost never true of me; I hardly ever feel this way.	Not often true of me; I feel this way less than half the time.	Sometimes true of me; I feel this way about half the time.	Usually true of me; I feel this way more than half the time.	Almost always true of me; there are very few times when I don't feel this way.
1. I'm looking forward to learning as long as I'm living.	1	2	3	4	5
2. I know what I want to learn.	1	2	3	4	5
3. When I see something that I don't understand, I stay away from it.	1	2	3	4	5
4. If there is something I want to learn, I can figure out a way to learn it.	1	2	3	4	5
5. I love to learn.	1	2	3	4	5
6. It takes me a while to get started on new projects.	1	2	3	4	5
7. In a classroom, I expect the teacher to tell all class members exactly what to do at all times.	1	2	3	4	5
8. I believe that thinking about who you are, where you are, and where you are going should be a major part of every person's education.	1	2	3	4	5
9. I don't work very well on my own.	1	2	3	4	5

Part 2

Self directed learning has been described as learning in which the majority of the following learning variables are controlled by the learner:

1. Identification of learning needs
2. Topic of learning activity
3. Purpose of the learning activity
4. Objectives or expected outcomes
5. Appropriate learning experiences
6. Evidence that objectives were achieved
7. Environment (where learning occurs)
8. Learning resources
9. Time (when learning occurs)
10. Pace (how fast learning occurs)
11. Methods of evaluation

(Cooper, 1980)

Please answer the remainder of the questionnaire with this description in mind.

1.. Have you completed an educational program, course or workshop to teach you how to use self directed learning methods with your students?

____ No
____ Yes

Think about the types of learning **experiences that you have provided** for students during tutorial in this nursing program at this faculty of nursing. Keep those experiences in mind as you answer the following questions.

Directions

This set of questions asks you to estimate the frequency (percent of time) with which **you provided certain types of learning opportunities** during tutorial to baccalaureate nursing students at this faculty of nursing. Write the NUMBER of the response which best represents your estimate. Use "1" for "00% of the time" and "5" for "100% of the time".

Percent	(00%)	(25%)	(50%)	(75%)	(100%)
Number	1	2	3	4	5

____ 5. At this faculty of nursing, how often have you provided the opportunity for students to decide WHAT they needed to learn?

____ 6. At this faculty of nursing, how often have you provided the opportunity for students to determine the TOPIC of their learning?

____ 7. At this faculty of nursing, how often have you provided the opportunity for students to determine the PURPOSE of their learning?

____ 8. At this faculty of nursing, how often have you provided the opportunity for students to identify their own OBJECTIVES (or EXPECTED OUTCOMES) for learning?

____ 9. At this faculty of nursing, how often have you provided the opportunity for students to select the LEARNING ACTIVITIES (eg. reading, interviewing, videos) that they felt were most relevant for their learning?

____ 10. At this faculty of nursing, how often have you provided the opportunity for students to select the RESOURCES (eg. books, journals, videotapes, resource people) that they thought would help meet their learning objectives?

____ 11. At this faculty of nursing, how often have you provided the opportunity for students to determine WHERE their learning would take place?

____ 12. At this faculty of nursing, how often have you provided the opportunity for students to determine WHEN their learning activities would occur?

____ 13. At this faculty of nursing, how often have you provided the opportunity for students to decide the PACE at which their learning activities would occur?

____ 14. At this faculty of nursing, how often have you provided the opportunity for students to identify HOW their learning would be EVALUATED (eg. tutorial evaluation, oral report, paper, written test)?

____ 15. At this faculty of nursing, how often have you provided the opportunity for students to determine the CRITERIA to be used for EVALUATING their learning (eg. criteria for tutorial process, grading papers, passing test score)?

_____16. At this faculty of nursing, OVERALL how often have you provided the opportunity for students to control the majority of learning variables involved in their learning?

Part 3

Think about the types of learning experiences that you have provided for students during tutorial in this nursing program at this faculty of nursing. Keep those experiences in mind as you answer the following questions.

Directions

This set of questions asks you to estimate the frequency (percent of time) that baccalaureate **nursing students followed through on learning opportunities** provided during tutorial at this faculty of nursing. Write the NUMBER of the response which best represents your estimate. Use "1" for "00% of the time" and "5" for "100% of the time".

Percent	(00%)	(25%)	(50%)	(75%)	(100%)
Number	1	2	3	4	5

____ 5. At this faculty of nursing, how often did students follow through on opportunities to decide WHAT they needed to learn?

____ 6. At this faculty of nursing, how often did students follow through on opportunities to determine the TOPIC of their learning?

____ 7. At this faculty of nursing, how often did students follow through on opportunities to determine the PURPOSE of their learning?

____ 8. At this faculty of nursing, how often did students follow through on opportunities to identify their own OBJECTIVES (or EXPECTED OUTCOMES) for learning?

____ 9. At this faculty of nursing, how often did students follow through on opportunities to select the LEARNING ACTIVITIES (eg. reading, interviewing, videos) that they felt were most relevant for their learning?

____ 10. At this faculty of nursing, how often did students follow through on opportunities to select the RESOURCES (eg. books, journals, videotapes, resource people) that they thought would help meet their learning objectives?

____ 11. At this faculty of nursing, how often did students follow through on opportunities to determine WHERE their learning would take place?

____ 12. At this faculty of nursing, how often did students follow through on opportunities to determine WHEN their learning activities would occur?

____ 13. At this faculty of nursing, how often did students follow through on opportunities to decide the PACE at which their learning activities would occur?

____ 14. At this faculty of nursing, how often did students follow through on opportunities to identify HOW their learning would be EVALUATED (eg. tutorial evaluation, oral report, paper, written test)?

____ 15. At this faculty of nursing, how often did students follow through on opportunities to determine the CRITERIA to be used for EVALUATING their learning (eg. criteria for tutorial process, grading papers, passing test score)?

_____16. At this faculty of nursing, OVERALL how often did students follow through on opportunities provided to control the majority of variables involved in their learning?

Thank you for participating in this study.

Appendix E

Semi Structured Interview: Student Focus Groups

1. Welcome and thank you for agreeing to participate in this focus group.
2. If you haven't already done so, could you please take a few minutes to fill out a consent. Just a reminder that our discussion over the next hour will be audiotaped.
3. While some of you may know each other, others may not so let's go around the table and introduce ourselves.
4. At this point you share the common experience of having had 2 tutorial experiences which have probably been both similar and different from each other. What I want to do today is explore your individual experiences with the amount of control you feel you have had over your learning within the structure of PBL.
5. When we think of control, we often think about 3 main themes.
6. How much choice have you had over deciding what to learn. For example, during PBL how do you become aware of content areas you're comfortable with and those you'd like to explore further?
7. How much choice do you have over deciding how you will learn? For example, during PBL how do you decide which strategies and resources? Are you using strategies/resources that you may not have used much in the past? Have you had feedback on your learning?
8. How do you know that you have learned? For example, during PBL how do you share your information with colleagues? Can you recall information when you need to? Are you able to give and receive feedback?
9. What is the most important thing your colleagues/tutor can do to help you take control over your learning?
10. In this nursing program, we are trying to promote student control over learning. What advice do you have for us?
11. Let me summarize the key points. Is this an adequate summary? Is there anything we have missed?
12. Thank you very much for sharing your experiences.

Semi Structured Interview: Faculty Focus Groups

1. Welcome and thank you for participating in this focus group.
2. If you haven't already done so, please take a few moments to fill out a consent. Just a reminder that our discussion over the next hour will be audiotaped.
3. What I want to do today is explore your experiences in providing students with control over their learning within the structure of PBL and your experiences of how much responsibility students assumed over their learning within their learning within the structure of PBL.
4. When we think about control, we often think about 3 main areas.
5. How much choice do students have in deciding what to learn? For example, during PBL how do they become aware of content areas they are comfortable with and those they might need to explore? How do you facilitate this process?
6. How do students choose to learn? For example, have you observed any changes in the strategies/resources students have chosen to use over time? How have you facilitated this process?
7. How do students demonstrate their learning? For example, how do you facilitate their awareness that learning is occurring?
8. What is the most important thing a tutor can do to help students take control over their learning?
9. Describe a time when you felt uncomfortable allowing students to take control over their learning?
10. In this program we are trying to promote student control over their learning. What advice do you have for other tutors?
11. Let me summarize the key points. Have I missed anything?
12. Thank you very much for participating.

Appendix F

Approval to Access Students and Faculty

UNIVERSITY OF ALBERTA

Undergraduate Office
3-109 Clinical Sciences Building
Phone: (780) 492-4404
Fax: (780) 492-4844

Graduate Office
3-134 Clinical Sciences Building
Phone: (780) 492-6251
Fax: (780) 492-2551

Research Office
3-126 Clinical Sciences Building
Phone: (780) 492-6832
Fax: (780) 492-2551

Teaching Office
4-111 Clinical Sciences Building
Phone: (780) 492-6240
Fax: (780) 492-2551

General Information
3-114 Clinical Sciences Building
Phone: (780) 492-4404
Fax: (780) 492-2551

Office of the Dean
3-129 Clinical Sciences Building
Phone: (780) 492-6236
Fax: (780) 492-2551

June 3, 1999

Bev Williams
Faculty Lecturer
Faculty of Nursing
University of Alberta

Dear Bev:

Regarding: Dissertation Research: Self-directed learning readiness of students after one year in PBL undergraduate nursing program

In response to your request of June 1, 1999, I am granting you permission to approach students and faculty in the first year of the undergraduate program to request their participation in your study. Please be reminded that prior to this you must obtain ethics approval. To assure minimal program disruption, you will need permission from individual instructors and tutors to access the students.

Best wishes in your research!

Sincerely,

for Marilynn J. Wood, RN, DrPH
Dean and Professor

Appendix G

Program Entry Data Collection Information (Faculty)

As most of you are aware, one of the outcome competencies for this program relates to students developing the skills and abilities necessary for lifelong learning with an emphasis on personal responsibility. At this point we have no way of determining whether or not our students are developing those skills and abilities. The instrument that I am using in this study might be useful for that purpose. I am also interested in the influence of PBL on students' and facultys' ways of learning.

Thank you for already distributing the information letters and consents to your students. Please remind them tomorrow that I would like completed consents of those wishing to participate in the study returned to me by the end of the day.

I know how hard it can be to take time away form tutorial so I greatly appreciate your willingness to let me have 15 minutes of tutorial time next week. I would ask that you leave the room when I arrive to further protect student confidentiality. I hope that by participating in this research study, students will begin to learn more about doing research.

I am also inviting your involvement in the study. I am interested in exploring the influence of PBL on faculty patterns of learning and faculty perception of learning opportunities provided and personal responsibility of students. Rather than returning to your next tutorial meeting, I have included the questionnaires in a package for you. You'll notice that the questionnaires are coded. The list matching the code numbers to the names is already locked away. I will only consult the list when I am ready to collect more information at the end of the academic year. I am interested in group data rather than individual data.

I would ask you to complete the consent if you are interested in participating in the study and return it separately from the questionnaires. There is a pre-addressed envelope included for return of the completed questionnaire. Since the questionnaire completion will take about 15 minutes, could you please return the questionnaires and consents by the end of the week. If you are not interested in participating, please return the entire package to me by the end of the week.

Thank you in advance for contributing to a better understanding of lifelong learning as a program outcome.

Any questions?

Appendix H
Information Letter (Student)

Title of Project: The self directed learning readiness of baccalaureate nursing students and faculty after one year in a context based undergraduate nursing program.

Principal Investigator: Bev Williams RN, MN, PhD (candidate)
Phone: 492-8054 E-mail: beverly.williams@ualberta.ca

Supervisor: Dr Rene Day PhD
Phone: 492-6481 E-mail: rene.day@ualberta.ca

Dear

As a nurse educator and fellow student, I am asking your assistance in a study that I am completing as part of my doctoral program. I am interested in how your learning progresses during the first year of the nursing program. I will ask you to fill out a questionnaire next week and fill out a similar questionnaire at the end of your first year in the nursing program. Completion of each of the questionnaires requires about 15 minutes. Through a process of random selection, several of you will be invited to participate in a one hour small group interview that will occur at the end of your first year.

I would appreciate your participation in the study. Your progress in the program will not be affected by your decision to participate or not. You may choose not to answer some of the questions and you are free to withdraw from the study at any time. Your name will not appear on any of the questionnaires and can not be linked to any information that you provide. Since I will be collecting data again at the end of your first year there must be some way to link the sets of information. Each questionnaire will be assigned a code number. The list of code numbers and names will be kept by the research assistant. I will also ask you to sign a consent form so that I can determine the response rate for the study. All findings of the study will be reported as group results. Neither you nor your responses will be identifiable in the report of the findings. The questionnaires will be kept in a locked filing cabinet in the Faculty of Nursing and will be destroyed in seven years.

Thank you for your assistance in contributing to research which may benefit nursing students in the future. If you have any concerns about any aspect of this study, you may contact Dr. Janice Lander at 492- 6763.

Sincerely,

Bev Williams RN, MN, PhD (candidate)

CONSENT FOR PARTICIPATION IN RESEARCH PROJECT
(Student)

Title of Project: The Self Directed Learning Readiness of Baccalaureate Nursing Students and Faculty After One Year in a Context Based Undergraduate Nursing Program

Principal Investigator(s): Bev Williams RN, MN, PhD (candidate)
Phone: 492-8054 E-mail:beverly.williams@ualberta.ca

Co-Investigator(s): Dr Rene Day PhD
Phone: 492-6481 E-mail:rene.day@ualberta.ca

Do you understand that you have been asked to be in a research study? Yes No

Have you read and received a copy of the attached Information Sheet? Yes No

Do you understand the benefits and risks involved in taking part in this research study? Yes No

Have you had an opportunity to ask questions and discuss this study? Yes No

Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason and it will not affect your grades or progress in the program. Yes No

Has the issue of confidentiality been explained to you? Do you understand who will have access to your questionnaire information? Yes No

This study was explained to me by: _____

I agree to take part in this study.

_____ _____ _____
Signature of Research Participant Date Witness

_____ _____
Printed Name Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____ _____
Signature of Investigator or Designee Date

Appendix I

Program Entry Data Collection Introduction (Student)

Hello, I'm Bev Williams, a 3rd year tutor and PhD student. I believe that you all received the information letter about the study that I am involved in as part of my doctoral program. For anyone who wants to participate in the study and wasn't able to return the consent by Friday, I do have additional consents.

As some of you are aware, one of the outcome competencies for this PBL program relates to students developing the skills and abilities necessary for lifelong learning. At this point we have no way of determining whether or not students are developing those skills and abilities. The questionnaire that I am using in this study might be suitable for that purpose, I am also interested in the influence of PBL on students' and facultys' ways of learning.

Filling out the questionnaire will require about 15 minutes of your time today and another 15 minutes of your time in February/March. Those of you who participate today and again in March have a chance to win a $75 gift certificate to the UofA bookstore. In addition, several of you will be invited to participate in a one hour focus group discussion about your first year learning experiences in March of 2000.

If you are not interested in participating, I would ask you to remain in the room. You can read over the material and hand it in with the rest of the students.

Each questionnaire has a code number. In order to protect the confidentiality of your responses, the list linking the code numbers and names is already locked away. That list will only be consulted when I get the questionnaires ready for distribution in March. I am interested in group data rather than individual data.

Providing you are willing to participate in the study, I would ask you to complete the consent if you have not already done so. Please avoid writing on the questionnaire and do not fill in your name on the top. Please use pencils provided to fill in the blue answer sheet. Please detach your name and put it into the bag for a chance to win the $75 gift certificate.

Any questions???

Program Completion Data Collection Introduction (Student)

You have now experienced 2 tutorial courses and I am here to find out a bit more about the possible influence of PBL on your learning.

Filling out the questionnaire will require about 15 minutes of your time today. Just a reminder that those of you who participate today have a chance to win a $75 gift certificate to the UofA bookstore. Also, some of you have been invited to participate in a one hour focus group discussion about your first year learning experiences either this afternoon or tomorrow morning. Light refreshments will be served to those of you who choose to participate in the focus groups.

If you are not interested in participating, I would ask you to remain in the room. You can read over the material and hand it in with the rest of the students.

As before, each questionnaire has a code number. In order to protect the confidentiality of your responses, the list linking the code numbers and names is already locked away. That list was consulted only when I got the questionnaires ready for distribution today. Again, I want to stress that I am interested in group data rather than individual data.

Please use the blue answer sheet for the first questionnaire and do not fill in your name on either the questionnaire or answer sheet. You will need to circle your responses on Parts 2 and 3 of the questionnaire. Please use pencils provided to fill in the blue answer sheet. Please detach your name and put it into the bag for a chance to win the $75 gift certificate.

Any questions???

Appendix J
Information Letter (Faculty)

Title of Project: The self directed learning readiness of baccalaureate nursing students and faculty after one year in a context based undergraduate nursing program.

Principal Investigator: Bev Williams RN, MN, PhD (candidate)
Phone: 492-8054 E-mail: beverly.williams@ualberta.ca

Supervisor: Dr Rene Day PhD
Phone: 492-6481 E-mail: rene.day@ualberta.ca

Dear

As a student and fellow nurse educator, I am asking your assistance in a study that I am completing as part of my doctoral program. I am interested in how your teaching progresses during the first year of the nursing program. I will ask you to fill out a questionnaire next week and fill out a similar questionnaire at the end of the first year of the nursing program. Completion of each of the questionnaires requires about 15 minutes. Through a process of random selection, several of you will be invited to participate in a one hour small group interview that will occur at the end of the first year.

I would appreciate your participation in the study. Your status as a nurse educator will not be affected by your decision to participate or not. You may choose not to answer some of the questions and you are free to withdraw from the study at any time. Your name will not appear on any of the questionnaires and can not be linked to any information that you provide. Since I will be collecting data again at the end of the first year there must be some way to link the sets of information. Each questionnaire will be assigned a code number. The list of code numbers and names will be kept separate from the questionnaires. I will also ask you to sign a consent form so that I can determine the response rate for the study. All findings of the study will be reported as group results. Neither you nor your responses will be identifiable in the report of the findings. The questionnaires will be kept in a locked filing cabinet in the Faculty of Nursing and will be destroyed in seven years.

Thank you for your assistance in contributing to research which may benefit nursing students in the future. If you have any concerns about any aspect of this study, you may contact Dr. Janice Lander at 492- 6763.

Sincerely,
Bev Williams RN, MN, PhD (candidate)

CONSENT FOR PARTICIPATION IN RESEARCH PROJECT (Faculty)

Title of Project: The Self Directed Learning Readiness of Baccalaureate Nursing Students and Faculty After One Year in a Context Based Undergraduate Nursing Program

Principal Investigator(s): Bev Williams RN, MN, PhD (candidate)
Phone: 492-8054 E-mail: beverly.williams@ualberta.ca

Co-Investigator(s): Dr Rene Day PhD
Phone: 492-6481 E-mail:rene.day@ualberta.ca

Do you understand that you have been asked to be in a research study?	Yes	No
Have you read and received a copy of the attached Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this research study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason and it will not affect your status as a nurse educator.	Yes	No
Has the issue of confidentiality been explained to you? Do you understand who will have access to your questionnaire information?	Yes	No

This study was explained to me by: _____

I agree to take part in this study.

_____ _____ _____
Signature of Research Participant Date Witness

_____ _____
Printed Name Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____ _____
Signature of Investigator or Designee Date

Appendix K

Focus Group Information Letter and Consent (Student)

Title of Project: The self directed learning readiness of baccalaureate nursing students and faculty after one year in a context based undergraduate nursing program.

Principal Investigator: Bev Williams RN, MN, PhD (candidate)
Phone: 492-8054 E-mail: beverly.williams@ualberta.ca

Supervisor: Dr Rene Day PhD
Phone: 492-6481 E-mail: rene.day@ualberta.ca

Dear

As a nurse educator and fellow student, I am asking your assistance in a study that I am completing as part of my doctoral program. I am interested in how your learning has progressed during the first year of the nursing program. Through a process of random selection, you have been selected to participate in a one hour small group interview that will occur at in the following location:

I would appreciate your participation in the interview. Your progress in the program will not be affected by your decision to participate or not. You may choose not to answer some of the questions and you are free to withdraw from the interview at any time. Your name will not appear on the audiotape and can not be linked to any information that you provide. I will also ask you to sign the attached consent form. All findings of the study will be reported as group results. Neither you nor your responses will be identifiable in the report of the findings. The audiotapes will be kept in a locked filing cabinet in the Faculty of Nursing and will be destroyed in seven years. If any further analysis is conducted with the study data, additional ethics approval will be obtained.

Thank you for your assistance in contributing to research which may benefit nursing students in the future. If you have any concerns about any aspect of this study, you may contact Dr. Janice Lander at 492- 6763.

Light refreshments will be served.

Sincerely,

Bev Williams RN, MN, PhD (candidate)

Group Agreement for Maintaining Confidentiality
(Student)

This form is intended to further ensure confidentiality of data obtained during the research study on the learning experiences of first year nursing students.

Do you understand that this focus group interview will be recorded on audiotatpe? Yes No

Do you agree not to talk about information relating to this study or interview with anyone outside of your fellow focus group members and the researcher? Yes No

This study was explained to me by: _____

I agree to take part in this study.

_____ _____ _____
Signature of Research Participant Date Witness

_____ _____
Printed Name Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____ _____
Signature of Investigator or Designee Date

Appendix L

Focus Group Information Letter and Consent (Faculty)

Title of Project: The self directed learning readiness of baccalaureate nursing students and faculty after one year in a context based undergraduate nursing program.

Principal Investigator: Bev Williams RN, MN, PhD (candidate)
Phone: 492-8054 E-mail: beverly.williams@ualberta.ca

Supervisor: Dr Rene Day PhD
Phone: 492-6481 E-mail: rene.day@ualberta.ca

Dear

As a student and fellow nurse educator, I am asking your assistance in a study that I am completing as part of my doctoral program. I am interested in how your teaching has progressed during the first year of the nursing program. Through a process of random selection, you have been selected to participate in a one hour small group interview that will occur , 2000 at in the following location:

I would appreciate your participation in the interview. Your status as a faculty member will not be affected by your decision to participate or not. You may choose not to answer some of the questions and you are free to withdraw from the interview at any time. Your name will not appear on the audiotape and can not be linked to any information that you provide. I will also ask you to sign the attached consent form. All findings of the study will be reported as group results. Neither you nor your responses will be identifiable in the report of the findings. The audiotapes will be kept in a locked filing cabinet in the Faculty of Nursing and will be destroyed in seven years. If any further analysis is conducted with the study data, additional ethics approval will be obtained.

Thank you for your assistance in contributing to research which may benefit nursing students in the future. If you have any concerns about any aspect of this study, you may contact Dr. Janice Lander at 492- 6763.

Light refreshments will be served.

Sincerely,

Bev Williams RN, MN, PhD (candidate)

Group Agreement for Maintaining Confidentiality
(Faculty)

This form is intended to further ensure confidentiality of data obtained during the research study on the teaching experiences of first year nursing tutors.

Do you understand that this focus group interview will be recorded on audiotape? Yes No

Do you agree not to talk about information relating to this study or interview with anyone outside of your fellow focus group members and the researcher? Yes No

This study was explained to me by: _____

I agree to take part in this study.

_____ _____ _____
Signature of Research Participant Date Witness

_____ _____
Printed Name Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____ _____
Signature of Investigator or Designee Date

Appendix M

Ethics Approval

Health Research Ethics Board biomedical research
2J2.11 Walter Mackenzie Centre
University of Alberta, Edmonton Alberta T6G 2R7
p.780.492.9724 f.780.492.7903
ethics@med.ualberta.ca

health research
1-42[illegible] Hall, University of Alberta
Edmonton, Alberta T6G 2G4
p.780.492.0839 f.780.492.1626
ethics@ahs.ualberta.ca

UNIVERSITY OF ALBERTA HEALTH SCIENCES FACULTIES, CAPITAL HEALTH AUTHORITY, AND CARITAS HEALTH GROUP

HEALTH RESEARCH ETHICS APPROVAL

Date:	July 1999
Name(s) of Principal Investigator(s):	Ms. Bev Williams
Organization(s):	University of Alberta
Department:	Graduate Studies; Faculty of Nursing
Project Title:	The Self Directed Learning Readiness of Baccalaureate Nursing Students and Faculty After One Year in a Context Based Undergraduate Nursing Program

The Health Research Ethics Board has reviewed the protocol for this project and found it to be acceptable within the limitations of human experimentation. The HREB has also reviewed and approved the patient information material and consent form.

The approval for the study as presented is valid for one year. It may be extended following completion of the yearly report form. Any proposed changes to the study must be submitted to the Health Research Ethics Board for approval.

Sharon Warren

Dr. Sharon Warren
Chair of the Health Research Ethics Board (B: Health Research)

File number: B-040799-NSG